

**FINANCIAL MANAGEMENT OF CONSTRUCTION
PROJECTS IN SAUDI ARABIA**

BY

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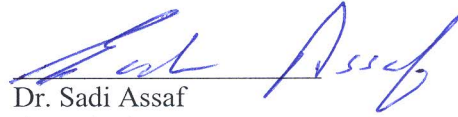
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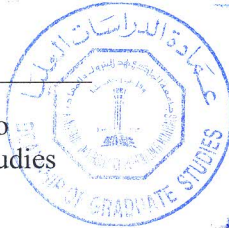
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I dedicate this thesis to my beloved mother, father and all of those who have been there
for me whenever I needed them.

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ABSTRACT

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Financial management plays a vital role in leading contracting firms to the maximum profit that can be earned from their undertaken projects. Understanding the basics of financial management by key players in these organizations guarantees an effective, well-controlled and profitable management for the firm's projects.

This study aims to define the current status of the financial system for contractors in Saudi Arabia. It looks forward to state the major sources of financial needs in construction projects, and how contractors manage these financial needs. Furthermore, it studies the financing techniques applied by contractors to fulfill their needs. Finally, it highlights the major obstacles that contractors encounter while financing their projects and studies their relation with the external financial institutions.

The needed data were collected via two developed questionnaires from banks and grade I, II, and III contractors those are located in Eastern Province, Saudi Arabia. Consequently, the collected data were analyzed using simple statistical tools such as means, standard deviations, etc. Twenty five contractors and nine banks participated in this study.

The major findings of the research revealed that the contractors in Saudi Arabia apply a combination of various financing techniques in a way that keeps their projects in a good financial status with minimum financing cost. However, the study declared that the application of cash flow management tools needs more improvements to be effectively applied by contractors to assist them in making the best decisions in the regard of financing their projects. From another point of view, the research findings stated that the banks in the Kingdom should insert some improvements to enhance the approval process of a contractor financing application. This will develop better relationship between contractors and banks.

ملخص الرسالة

الاسم الكامل: عبدالعزيز السيد القرا.

عنوان الرسالة: الإدارة المالية لمشاريع الإنشاءات في المملكة العربية السعودية.

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الإدارة المالية تلعب دوراً فعالاً في قيادة شركات المقاولات نحو تحقيق أقصى قدر من الأرباح من خلال تنفيذها للمشاريع المخطط بها. فهم أساسيات الإدارة المالية من قبل أ□□□ القرار في هذه الشركات ضمن الإدارة الفعالة والمربحة لمشاريع الشركة.

تهدف هذه الدراسة إلى فهم الواقع الحالي للإدارة المالية للمقاولين في المملكة العربية السعودية. إنها تتطلع إلى تحديد المصادر الرئيسية للاحتياجات المالية في المشاريع الإنشائية، بالإضافة إلى معرفة كيفية إدارة المقاولين لهذه الاحتياجات. علاوة على ذلك، إنها تدرس أساليب التمويل المطبقة من قبل المقاولين لتلبية احتياجاتهم المالية. أخيراً، هذه الدراسة تسلط الضوء على العقبات الرئيسية التي تواجه المقاولين خلال تمويل مشاريعهم بالإضافة إلى علاقتهم مع المؤسسات المالية الخارجية (البنوك).

تمت عملية جمع المعلومات الخاصة بالدراسة من خلال إنشاء استبيانين مختلفين تم توزيعهما على المقاولين من الدرجة الأولى والثانية والثالثة، بالإضافة إلى البنوك الكبرى في المنطقة الشرقية. تم تحليل هذه البيانات لاحقاً باستخدام بعض الأدوات الإحصائية البسيطة للوقوف على نتائج الدراسة.

أولاً، تحت النتائج الرئيسية للبحث أن المقاولين في المملكة العربية السعودية يقومون بتمويل مشاريعهم من خلال تطبيق نظام تمويل جمع بين أكثر من مصدر تمولي بطريقة تمكنهم من إدارة مشاريعهم مالياً بفعالية وبأقل تكلفة تمويلية ممكنة. على الرغم من ذلك، تبين من خلال نتائج الدراسة أن أدوات الإدارة المالية تحتاج إلى تم تطبيقها من قبل المقاولين بشكل أكثر فعالية ليتمكنوا من اتخاذ القرار الأفضل بما يخص تمويل مشاريعهم. من ناحية أخرى، أفضت الدراسة إلى البنوك في المملكة العربية السعودية تحتاج إلى تضيف بعض التعديلات لتطور إجراءات الموافقة على طلبات تمويل المقاولين، والتي من شأنها أن تقضي على تقوية وتحسين العلاقة ما بين المقاولين والبنوك في المملكة.

CHAPTER 1

INTRODUCTON

Construction firms' owners, as other businesses' owners, have a fundamental goal of their business; maximizing their profit by developing their organization's activities and projects. One of the most effective tools that should be applied by the management team of any construction firms is *Financial Management*. Financial management plays a vital role in leading a firm to the maximum profit that can be earned from whatever project that may be undertaken by the firm. Understanding the basics of financial management by key players in these organizations will guarantee an effective, well-controlled and profitable management of the firm's projects (McCadden, 2012).

This chapter introduces the topic of *Financial Management of Construction Projects in Saudi Arabia*. The statement of the problem, the objectives of the study and the significance of conducting this research are discussed in this chapter.

1.1 Statement of the Problem

Construction industry's growth has developed a competitive environment for contractors. They need to establish their projects based on well-studied plans from different perspectives, so as to guarantee a good standing in the market. Actually, the

unpredictable nature of construction projects plays a central role in keeping contractors in a risky environment.

One of the main factors that have a great effect on the success of any construction project is the aspect of project financing. In fact, the proper selection of financing technique that will allocate resources for a project is the first step in ensuring project success. This fact is especially true in the construction industry. Consequently, how to finance a project is not a decision to be taken by financial personnel only. Rather, since it is a decision that dictates the whole progress of the project, many parties are involved in the decision making process of a project's finance. In particular, engineers, economists and investors, will allocate their experience and knowledge to serve the selection of the best financing system that will provide profitable projects from the early stages of the project till the project is transferred to facility and start generating revenues for owners.

In general, the idea behind selecting best financing system is to keep the contractors in an active status concerning cash inflow and cash outflow. This will support them in the various transactions that they will pass through during project construction. In fact, what makes this a difficult target, is the dealing with many parties during the project. Contractors will continuously pay suppliers and subcontractors to provide the project with needed resources. Also, they will receive progress payments from the project owner during project life cycle. The challenge here for contractors is to minimize this gap between cash inflow and cash outflow, i.e. to overcome expanding the range of overdraft by the most effective systems of financing the project.

As mentioned previously, the main difference between construction projects and any other types of projects is the uncertainty that will face the construction projects during its life cycle. This uncertainty keeps the danger of underestimation or overestimation of project's elements close to the contractor. Moreover, the construction projects require relatively high capital compared with other types of projects. Thus, managing the finance of the project is a must. Controlling cash inflow and outflow plays a very important role in avoiding projects' failure and construction firms' bankruptcy (Tarek & Yaqiong, 2014).

In addition, construction industry has been defined as one of the industries that deal with many sources of risk. From financial point of view, this risk resides in the failure of accomplishing profitable project.

Actually, due to the competitive environment of construction market nowadays, new financing techniques are being applied. These financing techniques, especially for large projects, depend mainly on out sources. Correspondingly, financial risk appears here from more than one source. Underestimation of the expenses that these financing sources will charge the contractor, one source of this risk occurrence (Lee, Lim, & Arditi, 2012), another, is the fact that once the project financially failed, the contractor –most of the time- is the only entity that will carry this lost (Gatti, 2008).

To avoid failure possibilities of the financial structure of a construction project, an important management tool that needs to be effectively applied is to conduct a well-studied cash flow analysis. This will lead to choose the most optimum financing technique (Kenley, 2003).

Managing the cash flow of a construction project is not just a tool to predict project costs and revenues; actually, it is a complete financial evaluation system that will guarantee the existence of contractor firm in the market. In fact, it was found that the inadequate control of cash flow caused leaving many firms out of the market (Tarek & Yaqiong, 2014). Thus, an accurate prediction of project cash flow and performing a good finance plan will keep the construction firms on the track in the current competitive environment (Tarek & Yaqiong, 2014).

Based on the importance of managing the cash flow for construction projects, the selection criteria of the best financing technique has become one of the most crucial financial management tools. During the last decades, many construction financing techniques had been developed depending on the status of financial environment. The purpose of financial management of construction projects is to choose the most suitable financial system that will deliver a successful and profitable project (Yates, 2007).

Regardless of the financial ability of the project's owner to fund his project completely, the contractor still needs to be in a financial situation that enables him to fulfill all his obligations of delivering the project as per the contract requirements (Al-Dulaijan, 1987). As a result, financial management of construction projects is a tool that needs to be employed effectively by decision makers from the early stages of the project, and, updated continuously in tandem with a project's progress. This will boost the financial success for the individual projects and the whole firm in the market (Al-Dulaijan, 1987).

The competitive environment in the construction industry in Saudi Arabia market forces contractors to find the best financial solutions for themselves, so, they will be able to face the different challenges and difficulties, and, keep themselves on the track. This research will look intensely at these financial solutions, their requirements and their performance.

1.2 Research Questions

This research raises the following questions and will introduce answers for them:

1. What are the sources of initiating special financial needs for construction projects?
2. What are the techniques adopted by contractors in financing their projects?
3. What types of difficulties do contractors face in applying these techniques?
4. How can the contractors overcome these difficulties and ensure continuous and profitable progress of their business?

1.3 Research Objectives

The main objective of this research is to reveal the methods that contractors in Saudi Arabia apply to finance their projects. This research studies the sources of funds that contractors need to finance their projects, the problems and difficulties that they may encounter during applying their financing methods, and, the effectiveness of these financing methods. These objectives can be outlined as follow:

1. Defining the cash flow process in construction projects.

2. Highlighting the current construction projects' financing techniques followed by contractors in Saudi Arabia.
3. Studying the performance of these techniques.
4. Determining the problems and difficulties that contractors in Saudi Arabia encounter in financing construction projects.
5. Pinpointing the strengths and weaknesses of these techniques.

1.4 Scope and Limitations

This research studies the financial methods that contractors in Saudi Arabia apply to satisfy their financial obligations. However, due to time and budget constraints, this research will be limited to:

1. Studying financial management of grade I, II, and III contractors which have offices in the Eastern Province of Saudi Arabia.
2. Local financing techniques are the only techniques that will be introduced and defined in this research.

1.5 Significance of the Study

An essential tool that should be well utilized by decision makers in the construction industry is the financial techniques knowledge. Lately, many financial solutions were introduced to the construction industry market, fulfilling the needs for the

continuous expansion in this market. For the companies that tend to survive in the market, it is also imperative that they keep abreast with these techniques as their business expands (Yates, 2007).

The contractors need to effectively manage their business to assure securing themselves against bankruptcy risk. Many researches had showed that the poor financial management for contractors was the main driving force that resulted in them exiting the construction market (Tarek & Yaqiong, 2014).

This combination of massive projects involved in the construction industry and nonstop challenges that contractors encounter, oblige them to effectively utilize the management tools that will assure them a well standing position in the market. Financial management is one of these important tools. Contractors-unless they manage themselves financially in an effective way- will always be on the edge of failure.

As a result, the need of finding new financial solutions has increased lately. Many projects cannot be adopted by single entity (contractor) due to their huge financial needs, however, contractors -once they decide to stay in the market- cannot keep themselves away from these projects. Alternatively, they need to find new financial solutions, that will enable them to maximize their investment in the market (Tiong & Yea*, 1993).

Applying the principles of financial management demonstrated a significance improvement in the construction market from the contractor's perspective (Tiong & Yea*, 1993). On the other hand, financial institutions, which were the foundation of developing new financing techniques, had, also, established a good business in this field (Tiong & Yea*, 1993).

This study looks deeply at the current financial systems which contractors in Saudi Arabia adopt in financing their construction projects. Consequently, it shows the major challenges that they encounter while applying these techniques. From another point of view, this study concludes the requirements of financial institutions to liquidate a contractor with the sufficient capital that will enable him to run their projects till the handover stage.

Furthermore, this research identifies the most important characteristics of the optimum financial technique which will greatly support the contractors by enabling them to expand their business safely from a financial point of view.

Finally, the research highlights the major conflict of interests between the contractors and the financial institutions in Saudi Arabia, and, tries to find the most feasible solutions that will allow them to achieve their goals and eliminate the weaknesses in their relation.

CHAPTER 2

LITERATURE REVIEW

This chapter presents the findings of some researches which have studied contractors' financial management systems. The following paragraphs present the cash flow management, contractors' funding techniques, and, financial management of construction projects as reported in the literature.

2.1 Cash Flow Management and Forecasting

Once entities involved in a project start planning for their financial model, an important step here in order to generate the best financial model is to forecast and estimate an accurate cash flow for the project operations. Thus, decision makers can evaluate the financial technique that will fit the apparent cash flow of a project expenses (Gatti, 2008). Cash flow forecasting is a vital tool to establish a significant decision regarding how to liquidate the project with the cash. How much cash will get in and out? and, when this cash will do? are the main questions that will be answered after implementing cash flow forecasting. Moreover, forecasting the cash flow for a project gives the company the keys of knowing if they need an external financial aid. In other words, the decision of the need of a loan and to how to repay this loan is allied directly with this vital tool (Ross & Williams, 2013).

2.1.1 Importance of Cash Flow Management

The construction industry has unique characteristics which force the key players in construction companies to seek powerful tools that are able support their business and keep them aware of their standing at any given time. Working in the construction field entails exposure to many unknown variables. One needs to constantly predict, forecast, and be exceptionally good at aforementioned tasks. Otherwise, the entire business will collapse. However, businesses' owners look most of the time at the financial aspects in the market they are involved in. Cash flow management role comes here to give the key players an accurate visualization of the future by analyzing small amount of data –as the cash flow forecasting takes place at the beginning of the project- while making the analysis flexible for updating as the project advances and till the project is completed when it is reassigned from being a prediction to being a real tracing for the project cash flow to act –in this format- as historical data in the upcoming projects (Tarek & Yaqiong, 2014).

To manage the cash flow, is to manage its components. Therefore, we need to understand what cash flow is. Simply, cash flow can be defined as the process in which the cash inflow and cash outflow is monitored. In other words, cash flow is the difference between the cash spent by the firm and the cash received by it along a specific period of time (Tarek & Yaqiong, 2014).

Financial success for a firm doesn't depend on the volume of the firm's capital. Instead, for a firm to be financially successful, it should have the ability to fulfill its obligations in the various transactions it undertakes. In other words, the firm should

manage its own cash in a way that can give the firm a further view for the different financial transactions in a project. Thus, to assure a healthy and stable financial performance for a firm, it is a must to construct an effective cash forecasting model (Halpin & Senior, 2009).

Actually, the accurate estimation of cash flow in early stages of the project is considered a vital factor that provides an indication of the projects financial significance. There are many reasons behind this importance. Mainly, most of the financial models that can be built for a project are applicable only with a cash flow that guarantees paying project expenses for the different parties involved in the project. The need for accurate cash flow estimating is considered important because it is a direct way of determining a project's operating cost, i.e. the difference between cash inflow and cash outflow, which is the main initiator of the questions that will be raised by project's operators: How will this difference be funded? (Gatti, 2008).

Since it is directly affects the economic health of the project, cash flow estimation should be accurately defined. It was found that, more than 60% of construction firms failed due to economic reasons (Park, 2004).

2.1.2 Financial Components of a Construction Project

Recalling the cash flow of a construction project; we can divide it into two main components: (1) cash inflow (2) cash out flow. The cash inflow of a project is the receiving of cash against executing the work. In construction industry, this happens

usually through project payments by the client, payments against the materials incurred as part of the project, and, other payments that may be earned by the company against other activities. Conversely, the cash outflow is to pay the money from the company's account to creditors. Creditors could be suppliers of materials, subcontractors, labors, and, external financing sources those the company owed them loans (Ross & Williams, 2013). This warrants a further discussion of the financial constituents of the construction projects. Construction projects involve different types of financial components along with their progress which are still fall under the two main categories; cash inflow and cash outflow. These financial components can be defined as follow:

1. Revenues

Generally, the revenue can be defined as the money paid due to the exchange of goods between the firm and the client (Halpin & Senior, 2009). In the construction industry, the project revenues can be defined as the cash discharged to the contractor by the owner as a result of the activities of a project being executed by the latter. This represents one type of revenue referred to as operating revenues. On the other hand, the company may allocate the money from other sources. For example, selling the assets which are owned by the firm will generate a source of company revenue. This type of revenue is referred to as non-operating revenues (Halpin & Senior, 2009).

2. Costs

Along with project progress, different types of expenses are paid by the contractor to complete project activities sufficiently. Cost of material, equipment, labors and other related costs for project activities are defined as direct cost. The costs which are incurred

by the project team and not influenced by other activities are defined as project overhead. Project cost is the main source of cash outflow. In general, project cost can be divided into two main categories: (1) direct cost and (2) indirect cost (Crundwell, 2008). Figure 2-1 shows the types of project cost divided between these two categories.

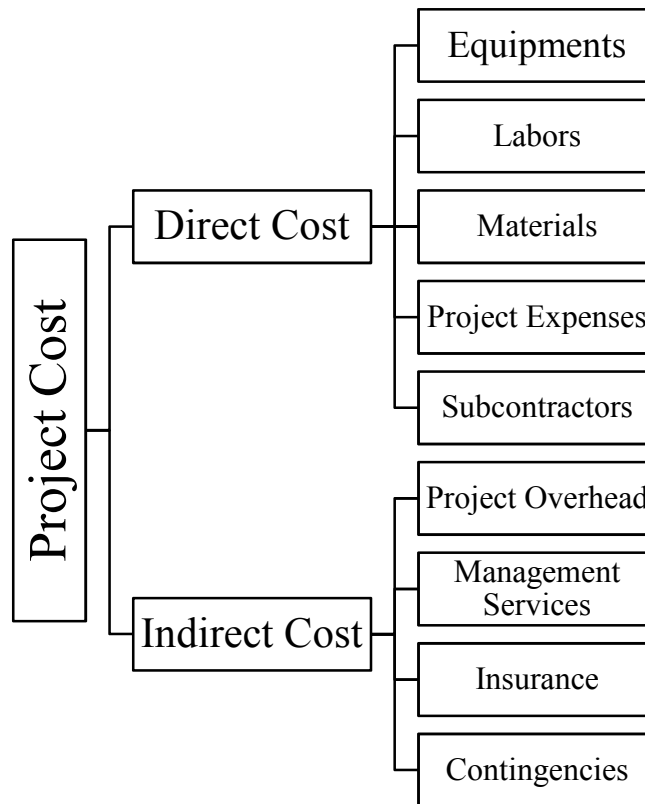


Figure 2-1: Project Cost Types (Crundwell, 2008) (Singh, 2009)

3. Taxes

Financially speaking, taxes are the money paid by the company to the government as a result of earning revenues\Profits.

4. Capital Expenditures

Capital expenditure is also known as *General Overhead*. These expenditures are incurred as a result of operating the whole firm. This is what differentiates it from the

project overhead, which can be loaded directly to a certain project (Clough, Sears, & Sears, 2000). Usually, the value of the overhead is less than 5% of the total project value (Halpin & Senior, 2009). However, this cost is influenced by the nature of a particular project and the size of the construction firm.

5. Working Capital

Working capital is the key to having an uninterrupted work progress without any suspension or delay that may result due to financial problems. It is dynamic cash that will drive a project safely to its completion. It may be asked, why working capital categorized as a separate type of financial need for a project. It is the same as cost types that were described previously, but, it represents the need of these costs at a specific time. This time period can be defined as the time lag between cost incurrence and receiving the payments against these costs from the project owner. Working capital should be known by a contractor at every stage of the project. Precisely, a contractor needs to know how much he will pay, when, and from where he will get the cash. Again, financial success means; to keep your project liquidized by the cash all the time. And, this is what working capital helps in achieving (Ross & Williams, 2013).

Finally, by analyzing these financial components, the cash flow of project can be presented to state the project financial needs.

2.1.3 Factors Affecting Cash Flow of a Construction Project

Cash flow in construction projects is affected directly by any substantial changes in its two main components; cash inflow and cash outflow. Previous studies have found

many reasons that may affect the cash flow in a construction project. Table 2-1 represents some of these factors categorized between cash inflow and outflow. However, some of these factors may affect both categories, depending on project characteristics.

Table 2-1: Factors Affecting Cash Flow in Construction Projects (Tarek & Yaqiong, 2014)

Factors Affect Cash Flow	Cash Inflow	Cash Outflow
Progress Payments	√	
Advance Payments	√	
Retention	√	
Variation Orders	√	√
Materials Delay	√	√
Competitors	√	
Project Duration	√	√
Rework	√	√
Claims and Disputes	√	√
Banks Interest		√
Payments for Materials		√
Poor Design		√
Subcontracting		√
Equipment Employing Method		√
Material Price Changes		√
Cash Forecasting and Estimating		√

Retention, which is the money that the owner hold until the contractor fulfills his entire obligations towards his contract, was considered one of the most important factors that affect the project cash inflow (Tarek & Yaqiong, 2014).

On the other hand, materials cost, as it forms the largest portion of the project cost, have a significant effect on the project cash flow. If market prices fluctuate, cash

outflow will be highly disturbed exposing the contractor to the risk of financial failure (Tarek & Yaqiong, 2014).

2.1.4 Cash Path in Construction Projects

Once a project item is executed by the contractor and its cost realized, the financial status of this item can be outlined and traced as follow: (see**Error! Reference source not found.**)

1. Materialization of the item cost as a result of purchasing or holding it to be assigned to the proposed project.
2. Assigning the item to the project. The cost in this stage is incurred to be a part of total project cost.
3. Installing the item in the project in its final shape to perform as it is specified in project documents. The cost in this stage is considered to be matured.
4. Billing the cost of the item by attaching it to the invoice which is issued by the contractor for the owner to be reviewed and approved.
5. Paying the cost of the item to suppliers, subcontractors or labors. The cost in this stage to be paid by the contractor to the entity which caused this cost.
6. The last stage of the cash path is that the incurred cost will be paid by the owner to the contractor after approving it as a part of project cost.

Tracing the previous stages of cash behavior along the project, we can define what is called payment lag. Payment lag is the gap between incurring the cost by the contractor for a certain item and receiving the payment by the owner for the same item. It is highly important for contractors to be aware of this lag as it will be the initiator of the

finance needed for a project. In other words, by determining this gap along the project, the amount of cash that has to be liquidated by the contractor will be determined. Hence, the contractor can assign the best financial technique which is most applicable to the project at hand (Halpin & Senior, 2009).

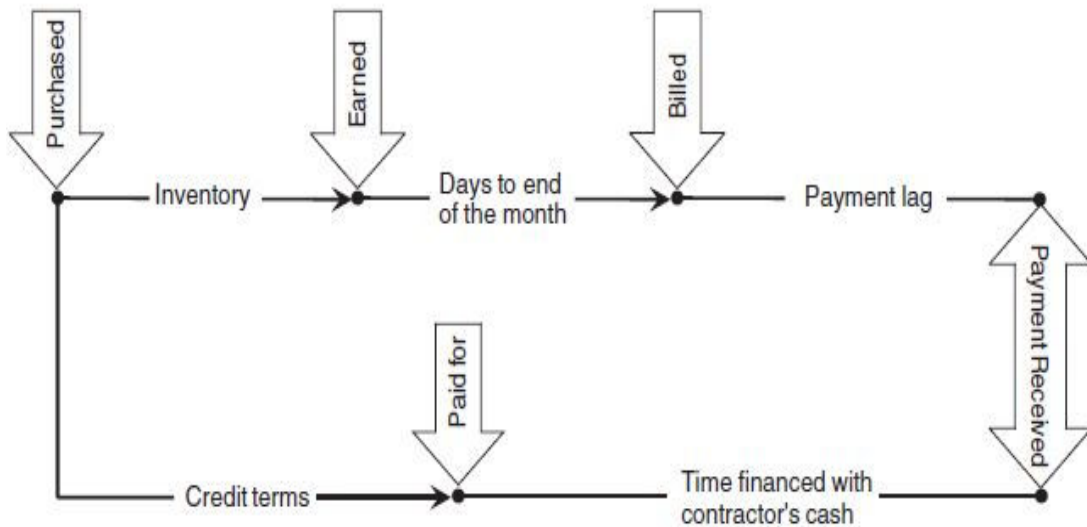


Figure 2-2: Cash Path in Construction Projects (Halpin & Senior, 2009)

2.1.5 Cash Flow Behavior of Construction Projects

The behavior of a construction project can be described in three different schemes from the point of starting the project until it's delivery to the owner. At the beginning of the project, the progress tends to gradually grow, i.e., the slope of the curve that represents the work progress is relatively low. After project components start getting linked to each other, the project displays a somewhat stable progress. This steady performance of the project is the one which is applicable to most of the project duration. At the final stages of the project, again, the project progress becomes lazy similar to the

initial stages. These three stages, combined together, will form what is known as the S-Curve. This S-Curve is defined for different cash profiles along the project. Figure 2-3 shows S-Curves for the value of the project, as well as, the cost incurred by the project up to date. The project value curve shows the amount of cash that the project has earned at any point in time along the project. On the other hand, the project cost is the amount of cash which is actually incurred by the project activities at any point of time along the project (Halpin & Senior, 2009).

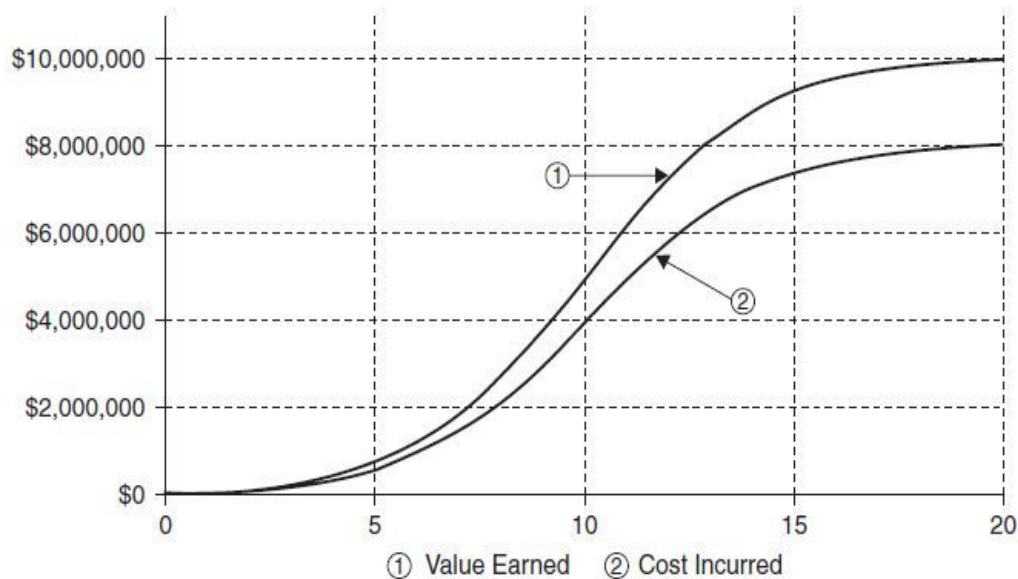


Figure 2-3: S-Curves for Project Value and Project Cost (Halpin & Senior, 2009)

In order for the cash outflow of a project to be beneficial, it should be compared with the cash inflow. The cash inflow for a construction project is identical to the outline of a stair's step. This shape arises from the nature of the periodical payments, which are paid by the owner over the project's lifecycle. The owner pays the contractor usually on a monthly basis after reviewing a particular month's invoices submitted by the contractor for the work completed in the preceding month. These monthly payments are the source of the curve jump at the beginning of every month along a project's duration. However,

the cash inflow curve starts after certain duration from the project's beginning and after a contractor has already started financing his project's operations. As an exception, in some projects, the owner pays the contractor an advance payment. This advance payment will provide the contractor with cash before he initiates the construction of a project (Halpin & Senior, 2009).

Plotting the previous two curves, i.e. the cash inflow and cash outflow, in one graph can illustrate the continuous gap between them over the project's duration. This gap is referred to as the overdraft. The overdraft in cash flow analysis can be defined as the difference between cash inflow and cash outflow. This difference can be, also, plotted on the same graph as a curve called net cash flow curve. This curve, as a result, will take the shape of a saw tooth. It can be stated that this curve is considered as the most important information that can be extracted from the previous analysis. The values which are distributed over this curve along with its progress are the amount of cash that the contractor will need over the project to liquidate his project's operations. In other words, the contractor will start his planning for financing a specific project by knowing these values. Eventually, he can decide which financial technique is the best for him to be applied in the matter of serving the project from a financial point of view (Halpin & Senior, 2009).

Figure 2-4 shows the three profiles of cash outflow cash inflow and cash net flow. As mentioned previously, the cash outflow (disbursements flow) curve will take the shape of a lazy S-curve. On the other hand, the cash inflow curve will be represented as a stair-steps curve. Subtracting the values of cash outflow curve from the offset values over

the cash inflow curve will result in a saw-tooth curve which can be defined as net cash flow curve.

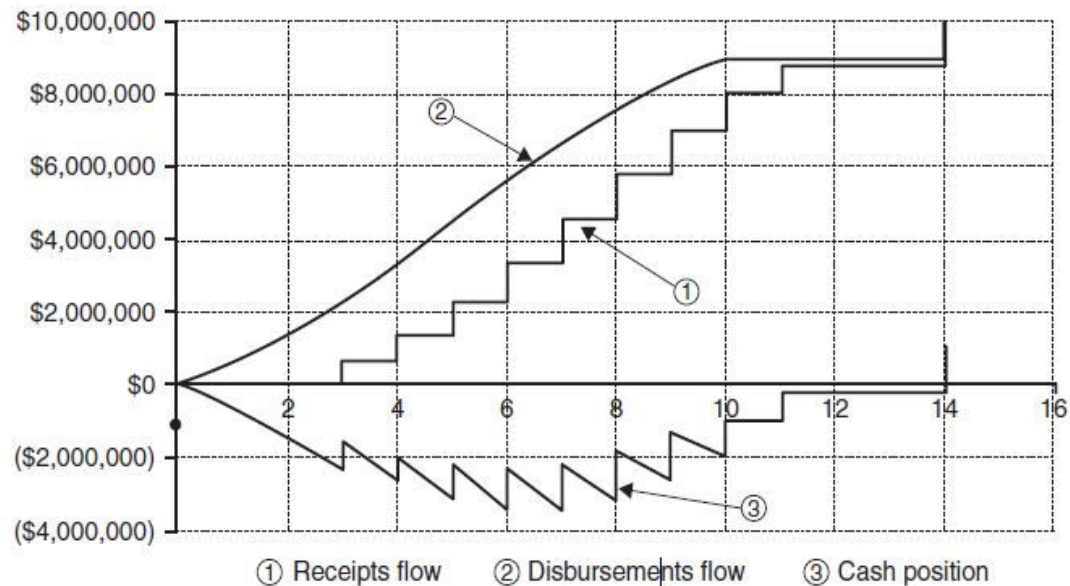


Figure 2-4: Cash Inflow, Outflow and Net flow Curves (Halpin & Senior, 2009)

2.1.6 Cash Flow Forecasting Restrictions

Forecasting the cash flow of a construction project is conducted to provide a more in-depth view of the financial status of the project. Despite this virtue, contractors rarely apply cash flow forecasting during the preconstruction stages of a project. As a result, the absence of applying pre-construction forecasting models renders a poor reflection of real financial behavior of the contractors' projects. Moreover, contractors don't consider the uncertainties and the unforeseen conditions that may emerge as a project unfolds. Contractors are also usually oblivious to the likelihood of payments delay.

Although the cash flow forecast is a necessity in determining the financial needs of a contractor before starting a project, contractors don't have enough time and resources to establish a cash flow forecast model before they are awarded.

In order to have a reliable cash flow forecast, contractors need to conduct a detailed analysis of cash flow in and out. Many factors, such as contract conditions, cost overruns, payments delay, procurement paths, construction methods, estimation errors and design variables are not considered in the majority of the forecasted cash flow models. This may produce imprecise cash flow forecast models.

2.2 Construction Financing

Once a new project is introduced to a contractor, one of the first issues that the contractor will consider is the financing method that he will use to provide the sufficient cash liquidity to serve the project's operations effectively, and deliver it to the owner within the planned time, and within his own estimated cost.

How to access the sources of financing a construction project plays a vital role in construction industry. It directly affects the success of the contractor's business. Put another way, poor financial management increases the chances of a contractor failing (Halpin & Senior, 2009).

The construction industry is considered a project-based business. This means that the contractor's business is developed by undertaken projects. Owing to this nature of

running a business it is essential to find the optimal financial solution to ensure that it is kept on the track (Halpin & Senior, 2009).

Two types of financing are considered as the main means by which contractors may liquidate their projects. These are either the internal earnings for the organization, or the commercial banks' financing facilities (Halpin & Senior, 2009).

We can see that the critical decision that a contractor needs to take of whether he will opt to finance the project by his own capital, or whether he will engage an external party to finance the project, depends largely on the degree of accuracy that the contractor can attain in estimating his cash flow operations during the project's life cycle (Hendrickson, 1998).

Moreover, before a contractor decides on whether he will be able to cover all his financial responsibilities internally, or will require an external loan, he needs to know what types of agreements will be set for the proposed project. The type of contract has a significance and direct effect on the financial method that the contractor will apply to finish his project. Also, he needs to study the corresponding level of risk that may occur along with applying this financing technique (Crundwell, 2008).

When it comes to financing a construction project, a contractor's goal will be to liquidate the gap between project expenses and project revenues. Although, the financial nature of a construction project is for the owner to pay the contractor periodical (progress) payments, nevertheless a contractor may encounter numerous impediments as a project progresses through its various phases. The owner progress payments may be delayed, affecting the progress of the project. However, contractor can avoid this

negative effect if he has the financial capability to, temporarily, cover this negative cash value which results from there being project expenses at a certain point of time exceeding that of the cumulative progress payments paid by the owner to the contractor (Hendrickson, 1998).

This gap between revenues and expenses is referred to as working capital. Working capital is the source of financial power that gives a contractor the first push needed to start a project. It is a term which defines the remaining amount of available assets that the contractor has after the deduction of the current amount of his liabilities (Steffan, 2008). This working capital is the figure that will dictate the decisions made by a contractor, namely, if he will use available credit lines, or will look for new sources of capital by using corporate finance (Yescombe, 2014).

It is the cash; the key of accessing the site works, supplying material, paying subcontractors, paying bills and overheads. Without a sufficient amount of cash that can cover these expenditures until a contractor receives payments from project's owner, the work cannot be accomplished by any other means (Ross & Williams, 2013).

2.2.1 Sources of Financing

In general, the working capital can be obtained either by borrowing money from an external entity (Debt), or by investing the internal resources of the firm using its own money. Figure 2-5 outlines the main sources of financing a construction project.

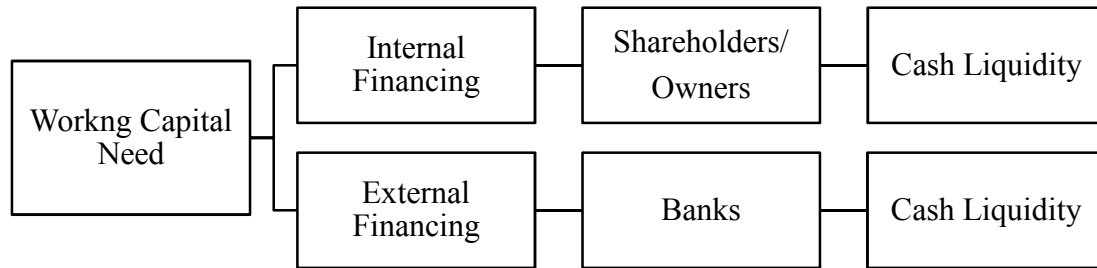


Figure 2-5: Main Sources of Project Finance (Ross & Williams, 2013)

Choosing the source for financing a project depends mainly on the size of the organization and its financial status. Some financing channels that are accessible for some firms may not be available for others. The financial strength of the firm's business, its relation with the external financial institutions, and the degree of risk that the business runs into may affect the choice of the best financing technique for the contracting firm. However, having no debt is not the key to success for a contractor. Rather, it is about managing the financial system for the organization in a professional manner such that the difficulties of liquidating the cash for the firm's projects are overcome (Ross & Williams, 2013).

2.2.1.1 Working Capital Analysis

Working capital, as it was defined previously, is the amount of money needed to operate the firm's projects sufficiently. The working capital is considered to be the difference between the current assets and the current liabilities of a firm. If this figure is positive, the firm is able to pay for its current liabilities, on the other hand, if it takes on a

negative value, there is a need for funding to liquidate a firm's operations and to enable it to pay for its current liabilities. The current assets and liabilities for the firm are listed as follow:

1. Current Assets

The assets of a construction organization are divided into fixed assets and current assets. Fixed assets, such as lands and equipment, comprise relatively low amount of the organization turnover. It is healthier for a company financial status to have high current assets to fixed assets ratio. The types of current assets are listed as follow:

a. Cash

The current position of the company's cash determines the amount of cash that can be considered as one of the company assets. This includes the net of the current cash, the generated cash in the coming accounting period and the negative cash requirements by the company.

b. Debtors

Debtors represent the amount of money owed to an organization by clients. This amount of money can be considered totally or partially at the end of the accounting period depending on the judgment of the finance personnel.

c. Stock

The materials which were purchased by the contractor and yet weren't integrated into the project execution are another source of a company's assets.

d. Work in progress

It is work which was executed by the contractor during the period between two successive accounting periods, but yet wasn't paid by the client. It is difficult for the contractors to assess this amount of money as there are few measures that can be utilized to validate this value.

2. Current Liabilities

The liabilities of a construction organization are mainly divided as follows:

a. Loans

Loans are considered as the outstanding amount of cash which is borrowed by the company by external entities, e.g. banks. (Ross & Williams, 2013)

b. Creditors

A source of company liabilities generated when a contractor owes money to external entities. (Ross & Williams, 2013)

c. Taxes

The money paid by the company to a governmental authority due to the income that the company earns annually. (Ross & Williams, 2013)

2.2.1.2 Internal Financing

Once a contractor finds that it is better for his organization to liquidate a certain project using the internal resources of the firm, many applications are available for him to provide the needed amount of cash. Figure 2-6 lists the main techniques that can be

applied as internal financing techniques. Moreover, these techniques are briefly described as follow:

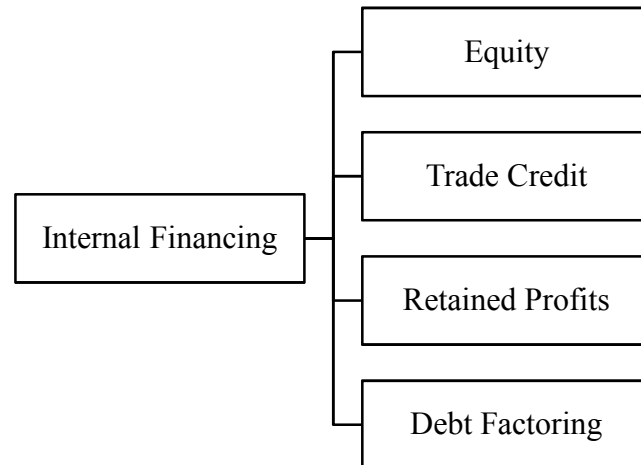


Figure 2-6: Internal Financing Techniques (Ross & Williams, 2013)

1. Equity

Equity capital, or, risk capital, is the invested money by the shareholders\ owners for liquidating the firm's projects. This type of financing brings high corresponding risk as there are no guarantees for the shareholders that their invested money will be paid back. The main difference between financing a project by an equity capital, or, financing it by an external loan is that once the business which is financed by the shareholders fails, they will be totally charged this loss. On the other hand, the creditors, those may facilitate cash loans for a firm, will not be responsible for the business failure, i.e., they will be repaid by either, the firm's assets or the personal assets owned by the firm's owners. However, sometimes this type of financing may be the only available source of fund,

particularly when the firm is in its early stages of development and, when there is no history that can be the foundation of an external fund (Ross & Williams, 2013).

2. Trade Credit

This type of financing is practically applied by all entities involved in any construction project. The owner applies Trade Credit during paying the main contractor his progress payments; consequently, the main contractor applies it by granting credit by his subcontractors, suppliers, etc. Trade credit is an efficient financing technique when a contractor's payments are delayed by the owner, and he requires a short term financing solution. It enables him to keep the cash for the expenses which cannot be credited. One-eighth of the turnover should be owned by the contractor as a working capital to ensure a comfortable financial relation with the entities that offer trade credits to him (Ross & Williams, 2013).

3. Retained Profit

After paying the taxes, the loans interests, and the shareholders dividends, some cash will remain in the business. This cash is known as retained profit. In cases in which this profit is considered relatively high, it can be utilized as a working capital to operate the firm's ongoing projects (Ross & Williams, 2013).

4. Debt Factoring

Construction firms may have money owed to them in the market. This money is useless as it is in the form of solid debt. The main concern for construction firms is to

have the cash in a liquid status. So, to liquidate this debt, a firm may go to sell it to factoring companies. These companies will buy this debt at a certain discount. This transaction will provide cash for the firm, but will also reduce the profit due to the application of the discount. The bought debt will then be totally recovered by the factoring company. This technique is chiefly applied in situations where the owed money is under disputes or claims (Ross & Williams, 2013).

However, as a result of reviewing many research which have studied the different methods that contractors use to finance their project, it was found that it is uncommon in the construction industry for contractors to finance their projects without adopting one of the finance techniques that will enhance their ability to stand safely in the market and avoid bankruptcy. It was found that the commercial banks and, the non-banking market are the main sources of financing a project (Yescombe, 2014).

2.2.1.3 Debt (Loan Capital)

Due to the huge nature of construction projects, the working capital is relatively high compared to a contractor's assets; consequently, this forces them to borrow the project working capital from external financial institutions. These financial institutions make their profit by lending the needed amount of cash to the sponsor entity and earn it back with an interest. In spite of this, this technique of financing a project is still relatively inexpensive to contractors when compared with other financing techniques (Callahan, Stetz, & Brooks, 2011).

Financial institutions have to set up strong securing techniques to ensure that the money given to the borrower is returned. To this end, the financial history of the borrower will be studied in terms of his commitment in repaying the lender entity. Also, the lender institute will analyze the current available assets that the borrower merges under the umbrella of the loan. With respect to this, it is necessary for the borrower to have enough assets that can be easily transferred to liquid cash in case a borrower is incapable of repaying the loan. Moreover, the ability of a project to finance itself is another important point that the lender will scrutinize to evaluate their ability to retrieve their loan. In other words, the cash flow of the project assists the whole borrowing system. Finally, the reputation of the borrower plays a vital role in building trust with the lender (Callahan, Stetz, & Brooks, 2011).

The main types of debt financing are outlined in Figure 2-7 and listed as follow:

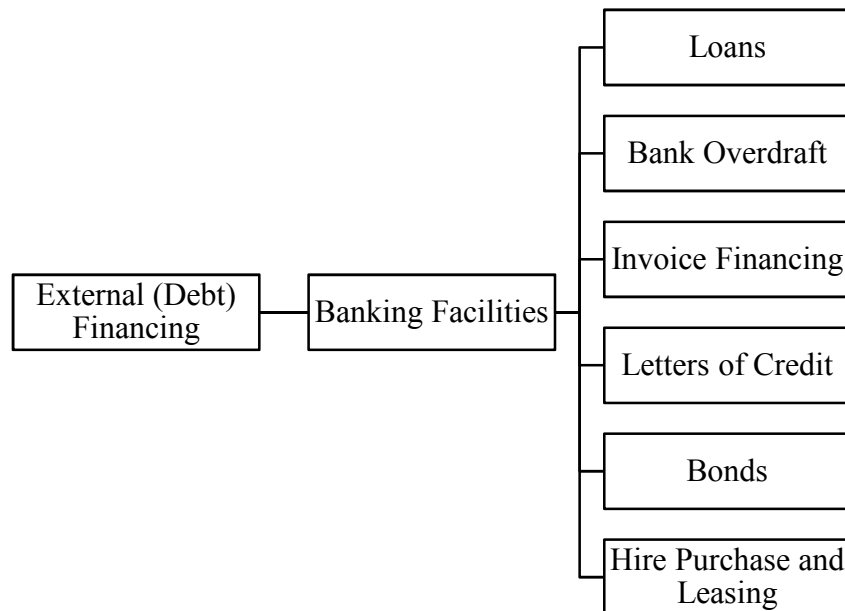


Figure 2-7: External Financing Techniques (Ross & Williams, 2013) (Al-Dulaijan, 1987)

1. Loans

Loans are the money borrowed from banks or other lending institutions\entities to liquidate the firms' projects. The borrowed loan is paid back to lender with a certain rate of interest. Usually, these loans are paid after a definite period. Referring to this period, the loans are divided mainly into three types; short term loans (max. 1 year), term loans (max. three years) and long term loans (as per the agreement between the firm and the lender). Usually, these loans are secured against the owned assets by the borrower; this may include lands, equipment, stocks, etc. (Ross & Williams, 2013).

2. Bank Overdraft

This type of financing is referred to as Line of credit. Bank overdraft is a financing facility which is structured based on agreed limits and specific conditions. Credit line provides liquid cash for the contractor upon his request. Accordingly, the rate of interest that will be charged on a contractor corresponds only to the amount of money borrowed by the contractor, i.e., it will not be related to the limit of agreed credit between the bank and the contractor (Al-Dulaijan, 1987). This financing technique cannot be considered a source of working capital; instead, it is an effective temporary source of fund to contractors. Although it is a good source of fund for contractors, bank overdraft should be well-planned before its acquisition. The reasoning behind this is that once a bank requests its loan, and, a contractor is unable to fulfill this loan at the specified time, he will be in a serious danger of insolvency (Ross & Williams, 2013).

3. Invoice Financing

Progress payments, which are paid periodically by owners, sometimes are not paid on time. The delay of these payments forces contractors to borrow money from banks. The amount of money which is needed here is almost equal to the amount of the delayed invoiced payments. So, firms in that case ask banks for a short term loan (max. 90 days) with an amount equal to the amount of the due invoices. Accordingly, banks pay contractors the amount of the due invoices after deducting the amount of retention and the compensation of the advance payment if any. Usually, this type of financing need a certificate from the owner states that the contractor is eligible to receive the due invoiced payments (Al-Dulaijan, 1987).

4. Letters of Credit

Letters of credit are documents that build bridges between the contractors and the suppliers that they deal with. These letters are issued by the bank to enable a contractor to purchase specific materials or equipment and receive it before incurring the payment of these items to the supplier. Also, in this relation, the supplier looks forward to receive a guarantee that the purchased material will be paid (Al-Dulaijan, 1987).

5. Bonds

Bonds represent the relation between three parties, the contractor (Practice), the owner (Obligee), and the bank (Guarantor). In this relation, the bank guarantees that the contractor will fulfill specific obligations toward the owner of a project. Types of these bonds are defined below:

a. Bid Bond

Mainly, bid bonds are implemented in construction contracts to secure the project owner against the failure of the awarded contractor in entering the project as per his bid and submitting all required bonds. Moreover, bid bonds work as filters in critical projects as they cannot be maintained easily by unqualified contractors. Usually, the amount of the bid bond is from 1% to 2% of the contract price.

b. Performance Bond

Performance bond is a bond that guarantees the completion of work by the contractor as well as the fulfilment of contractual obligations related to the undertaken project. In the case of contractor failure, the owner has the right to liquidate the bond as a compensation for the effect of contractor failure. 5% to 10% of the contract price is the range of the value of performance bond. A contractor will not be released from this bond until receiving the final handover certificate after the maintenance period.

c. Advance Payment Bond

In some projects, the contract may give the contractor an option of advance payment. In this case, he needs to get an advance payment bond from the bank against the advance payment he received from the owner. As there is no other reason for submitting this bond but to secure an advance payment, the amount of the bond will be equal to the amount of advance payment received, which is usually 10% to 20% of a contract's price. The advance payment will be deducted gradually from the contractor's progress payments. Correspondingly, the bank will reduce the amount of the advance payment bond with the same deduction percentage applied by the owner.

d. Retention Bond

In construction projects, an owner would deduct an amount of money from the contractor's progress payments to secure themselves against any unexpected event. The contractor has two options to get this money back. One is to submit a retention bond with an average amount of 10% of the project price. And he has the right to release this bond along with the initial handover period. Alternatively, the contractor may not submit a retention bond, but in this case, he can ask for his retained money only after final handover of the project. (Al-Dulaijan, 1987)

2.2.2 Project Finance Application for Contractors

Project finance is a financing technique that aims to provide cash liquidity from other sources than the current assets for project's sponsors. This financing technique is applicable regardless of the project-proportioned value of cash or assets owned by the sponsors. Basically, project finance were developed to satisfy the financial needs of projects by processing and evaluating a project's corresponding risk, and studying the project's ability to finance its own expenses backwardly (Gatti, 2008). Project finance, mainly, represents the combination of debt and equity in a non-resource or limited resource financial structure (Fight, 2006). Actually, from another point of view, project finance plays an important role in minimizing the involved risk in a project to reasonable amount which is considered acceptable for different entities in the project (Tiong & Yea*, 1993).

Project finance structure, even if various forms of it exist, has typical characteristics which layout the main principles of this financing technique:

1. Project finance technique fits the construction projects nature as it is a long-term financing technique.
2. Project finance deals with self-financed projects, i.e. a financial cycle should be available, and so, the project will be financially separated from the overall business of the company.
3. The revenues of the project will be the source of paying back the lender entity.
4. Cash flow of the project should be managed and estimated effectively in terms of covering the project expenses.
5. The proposed project is to be financed as a separate entity, i.e. no existing relation between the project and the mother firm. This separate entity is referred to as 'Project Company'.
6. The project's own expenses have more priority in consuming the project income than repaying the lender entity.
7. The capital cost of the project will be highly dependent on the project finance debt than the proportioned equity. Around 80% of the project cost will be financed through the share of project finance liquidated cash.
8. Equal distribution of risk between different project parties is a necessity.
9. An insurance agreement is to be set up between sponsors and lenders. This agreement is the only source of security for the lender entity against paying back the project finance dept.

(Gatti, 2008) (Yescombe, 2014)

2.3 Factors Affecting Construction Projects' Financing

When it comes to financial problems, the major problems encountered by contractors are related to payments. Indeed, payments delay and unfair payments are common practices in the construction industry field. Many excuses are usually raised by projects' owners whenever a delay in payment arises. Most of these excuses are related to the process of approving the contractors' invoices. However, sometimes delays in payments emerge because of a contractor's poor practices. For instance, lack of experience, misunderstanding the project's contracts, or disvalue the actual amount of the executed work (Ross & Williams, 2013).

Further, a contractor may not properly measure the amount of required work leading to financial problems. For example, they may not understand the difference between a unit price contract and a lump sum contract. This may lead to misestimating the financial status of their project at different stages in project development (Ross & Williams, 2013).

In fact, construction projects are not typical; usually each project differs from another depending on the unique relation between the contractor and the owner of that project. Looking deeply in this relation, it can be said that the financial status of a certain project behave flexibly until it takes its own characteristics and, hence, starts to affect the cash flow of the contractor (Ross & Williams, 2013).

Other than payments delay, misestimating contract price, pressure from banks, retained money by the client and poor cash flow management are some of many reasons

that may negatively impact the financial structure of a contractor (Ross & Williams, 2013).

2.4 Relation between Contractors and Banks

Knowing that the implementation of banking facilities is one of the most important financing instruments for contractors, the relation between these two parties, banks and contractors, should be defined in order to understand its effect on the utilization of this type of financing.

The relation between contractors and banks represents a business agreement between two parties for the purpose of borrowing money by the borrower (Contractors) from the lenders (Banks) in the instance that a contractor faces financial deficiencies. This agreement can take two forms: (1) direct and (2) indirect financing agreement. In the direct financing, the contractor contacts the bank directly to ask for a banking facility. On the other hand, the indirect financing is established by a third entity which is called 'intermediary'. The intermediaries are familiar with the banks' requirements and the contractors' needs; thus, they provide the desirable amount of money to contractors while providing banks with the requirements needed to fulfill the agreement conditions (Crundwell, 2008).

In order to assure a comfortable relation between a bank and a contractor, this relation should be organized and secured in a way that guarantees maximizing the benefits for both, the bank and the contractor. The main guarantees that will establish a commitment in this relation are the financial evaluation of the contractor (Crundwell,

2008). Usually this evaluation is conducted under certain requirements and securities, some of these requirements are listed as follows:

1. Organization profile.
2. Organization experience in the construction field.
3. Organization financial history.
4. Contractor's clients' characteristics.
5. Contracts' status report.
6. Financial Statement for the organization.
7. Audition of the financial statement.
8. Accounts receivable.
9. Balance Sheet.
10. Income Statement.
11. Contractor's future business plan.
12. List of ongoing contracts.
13. List of under bidding contracts.
14. List of completed contracts.
15. Summary of proposed financial needs.
16. Assets for collateral (Lands, equipment, stocks, etc.).
17. Personal guarantees.
18. Banks counter guarantees.
19. Corporate letter of guarantees.
20. Billing terms and policies.

CHAPTER 3

RESEARCH METHODOLOGY

The purpose of this chapter is to list the steps that were followed in conducting this study. It reveals the objectives of the study in a form of measurable data that can be processed to answer the questions which were raised at the beginning of the research. It lists the needed data to complete the research, as well as, the sources and key informants of these data. Consequently, it shows the tools that were used in collecting the needed data. Also, this chapter goes further to show the proposed population in the research and the applied method of sampling.

3.1 Introduction

Research strategy can be defined as the system that the researcher will apply in conducting his research till he answers the research questions (Dissertation Writing Help Online Services For UK, USA, AU). For a research strategy to be effective to the researcher, it should be designed in a way that will aid in defining the objectives of the research, highlighting the required data, collecting it, analyzing it , and, finally, concluding the results and providing recommendations of the research (Dissertation Writing Help Online Services For UK, USA, AU).

This research as it is a descriptive research; aims to define the current statement of the defined problems in CHAPTER 1. In other words, the researcher here has no personal

judgment for the research results and findings; his task is only to summarize the identified findings after the data analysis process is completed. Moreover, descriptive research –as the one proposed here-illustrates the reasons behind these findings and tries to give the recommended solutions by the studied sample (Kothari, 2004). Accordingly, the researcher adopted surveying techniques to reach the goal of the research, and to end the study with efficient results that will assist in improving the current financial systems in contracting firms.

Figure 3-1 below layouts the research strategy that was used in conducting this research.

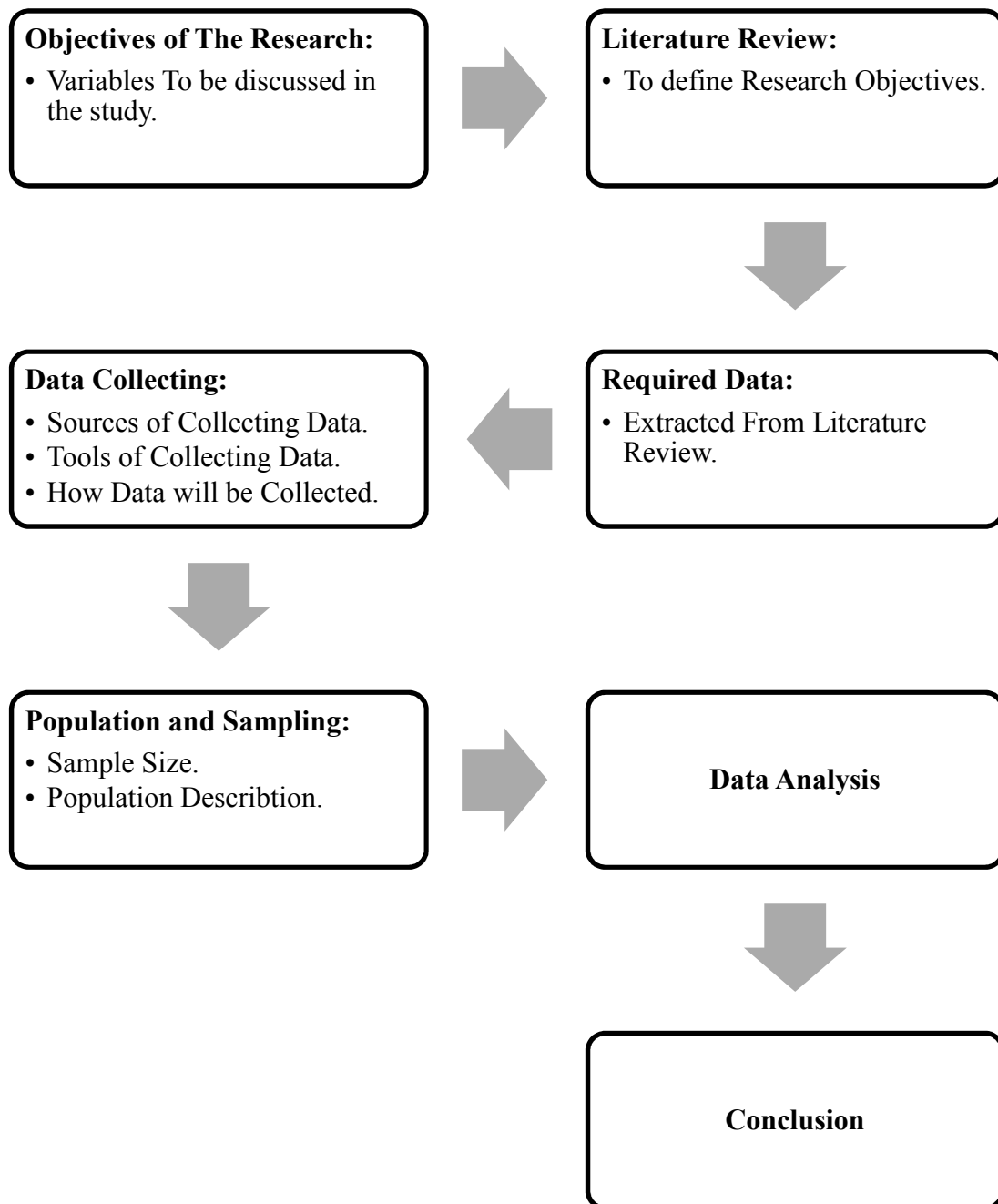


Figure 3-1: Research Strategy Layout

3.2 Required Data

Along with conducting the literature review in CHAPTER 2, many data had been identified as vital requirements to realizing this research. This section lists all the data that was analyzed in producing the well-concluded recommendations found at the end of the research.

3.2.1 Financial Transactions in Construction Projects

To begin determining the financial needs that compel the contractor to apply project financing, it is essential to identify the nature of financial transactions that occur in the course of a project. The required data which are related to these transactions are listed below:

1. Cash outflow

- a. Material suppliers.
- b. Manpower.
- c. Subcontractors.
- d. Mobilization.
- e. Project Overhead.
- f. General Overhead.

2. Cash inflow

- a. Owner advance payment.
- b. Owner progress payments.
- c. Retention.

- d. Final payment.

3. Payments Sources

4. Owner payments delay

5. Cash flow management and forecasting

3.2.2 Current Financing Techniques

The required data related to the current applied financing techniques that contractors in Saudi Arabia adopt to finance their projects are listed as follows:

1. Self-Financing techniques

- a. Firm's available cash (Retained Profit).
- b. Equity (Financing by firm's owners\shareholders).
- c. Trade Credit (Paying debtors when cash is available).

2. External financing techniques

- a. Short Term Loans (Max. 1 year).
- b. Term Loans (Max. 3 years).
- c. Long Term Loans.
- d. Overdraft Accounts.
- e. Invoice Financing.
- f. Bid Bonds.
- g. Advance Payment Bonds.
- h. Performance Bonds.
- i. Retention Bonds.

- j. Letters of Credit.
- k. Hire Purchase\Leasing (For equipment's funding).

3.2.3 Problems and Difficulties in Finance

1. The potential factors that may affect project financing are listed as follows:

- a. Payments delay by the project's owner.
- b. Absence of advance payment.
- c. Project delay by owner or consultant.
- d. Banks inability to facilitate finance.
- e. Banks requirements to obtain a financing facility.
- f. Cash margins blocked by banks.
- g. Over or under estimating of the required loan.
- h. High rates of current financing techniques.
- i. Lack of experts in construction financial management field.
- j. Being the organization in the low class ranking by the banks.

2. The problems that a contractor's organization may encounter when applying for banking facilities are listed as follows:

- a. Delay in responding to finance applications.
- b. Banks' inability to facilitate finance.
- c. Banks' requirements to obtain a financing facility.
- d. Banks' involvement in monitoring the cash flow of the project.
- e. Banks' financial ranking for the organization.

- f. Cash margins blocked by banks.
- g. Limitation in financial facilities.
- h. High finance interests.
- i. Conditions of the finance.
- j. The approval process is lengthy.
- k. The approved financed amount is less than what is requested.
- l. Bank control of progress payments.

3. The banks' requirements for offering financing facilities are listed as follows:

- a. Organization profile.
- b. Organization experience in the construction field.
- c. Organization financial history.
- d. Profiles of organization's owners.
- e. Contractor's clients' characteristics.
- f. Financial Statement for the organization.
- g. Audition of the financial statement.
- h. Accounts receivable.
- i. Balance Sheet.
- j. Income Statement.
- k. List of ongoing contracts.
- l. List of under bidding contracts.
- m. List of completed contracts.
- n. Assets for collateral (Lands, equipment, stocks, etc.).

- o. Personal guarantees.
- p. Corporate letter of guarantee.
- q. Billing terms and policies.
- r. Project time schedule.
- s. Project type.
- t. Value of the contract.
- u. Cash flow projection.
- v. Contract type.
- w. Clarity of scope of work.

4. The encountered problems for banks after facilities approval are listed as follows:

- a. Contractors delay payments beyond due dates.
- b. Contractors fail to fulfill their covenants of finance documentation.
- c. Changes in the ownership of a project prior an agreed upon date.
- d. Contractors subjected to a court judgment.
- e. Revoking of any permits or license for contractor.
- f. The project is abandoned.
- g. Failure of any party in the project contract.
- h. Contractor's poor performance in executing his project.

5. The reasons for rejecting a contractor's application for a bank facility are listed as follows:

- a. The contractor has a bad history in payment.
- b. The contracting firm's owners have no good financial reputation.
- c. The contractor history in breaching finance contracts.
- d. The contractor previous history in claims.
- e. The contractor is new to the construction industry.
- f. Revoking of any permits or license for contractor.
- g. The contractor's size in term of his assets.
- h. The contractor's available cash in his accounts.
- i. The contractor has a history of poor performance in executing his projects.
- j. The project owner.
- k. The endorsement documents.

3.2.4 Performance of Financing Techniques

The data related to measuring the performance of the current applied financial techniques are listed as follows:

1. Suitability of applying various financing techniques.
2. Efficiency of applying various financing techniques.
3. Finance cost for various financing techniques.
4. Risk involvement in various financing techniques.

3.3 Data Collection

The next subsection reveals the main sources of the aforementioned data. In addition, a delineation of the tools utilized in the data collection process will be provided. Lastly, the methodology of the application of these tools will be detailed.

It should be noticed that the type of data collected in this research is defined as a primary data. Primary data is a data collected for the first time by the researcher, i.e. it was not based on previous surveys (Kothari, 2004).

3.3.1 Data Sources

In order to obtain a sufficient set of data to serve this research effectively, the sources of the data need to be selected carefully. Due to the diverse nature of this research, the data was collected from two different sources. The first source was the contracting firms existing in the eastern province of Saudi Arabia. These contracting firms were the main sources of data as the research is conducted from their point of view. Secondly, the financial institution's located in the Eastern Province of Saudi Arabia perspectives were also solicited in the data collection process.

3.3.1.1 Contracting Firms' Key Informant

Due to the sensitivity of the research topic owing to the fact that its questions were related to the financial statement of the firm, the key informant who was considered in the surveyed firms was one of the top management team in the construction department. As an exception, this type of data was sometimes derived from key personnel in the accounting\financing department in the instances in which these individuals were involved in the construction financing transactions.

3.3.1.2 Banks' Key Informant

The private financial facilities that serve the financial structure for contracting firms in Saudi Arabia are mainly offered by banks. Accordingly, banks in the Eastern Province were the second source of data. The banking facility department at these banks furnished the relevant data. Again, as the nature of the data was sensitive, the director of the particular department was the key informant.

3.3.2 Data Collection Tools

This section describes the statistical tools which were applied in the mean of collecting the required data.

3.3.2.1 Characteristics of Data Collection Tool

To collect the needed data for the research, a questionnaire was developed and used as a tool for data collection. A questionnaire can be defined as a set of sequenced questions written by the researcher in a certain form. Usually, the questionnaire is sent to the respondents by mail. After receiving the questionnaire, the respondent is expected to answer the questions contained in the questionnaire by his own self and return it to the researcher (Kothari, 2004).

A pilot survey is conducted after the final shape of the questionnaire is generated to test its clarity. This method guarantees the elimination of any weakness existing in the questionnaire (Kothari, 2004). This research's questionnaires were sent to numerous experts in the field to solicit their feedback in terms of the questionnaire's quality and sufficiency. Accordingly, the needed modifications were incorporated in to the questionnaires to develop a final version before the commencement of the surveying process.

The type of the questionnaires that were developed is structured questionnaires. A structured questionnaire is one that includes pre-defined set of questions. The opportunity for the respondents to provide their own answers is greatly restricted in this type of questionnaire. Instead, the respondents will be asked to provide their response to fixed-shaped questions by selecting the answer from a set of pre-prepared answers (Kothari, 2004).

The nature of the research bounded the researcher to conduct two different types of surveys. The first questionnaire was introduced to contracting firms in Eastern Province of Saudi Arabia to collect a majority of the needed data. On the other hand, another questionnaire was oriented to look for data from the banks in the Eastern Province of Saudi Arabia.

Both questionnaires were tested and modified using a pilot survey technique, mentioned previously. Experts in the field analyzed and completed the questionnaires and provided their valuable comments and recommendations that led to the generation of the final version of the questionnaire.

3.3.2.2 Description of Questionnaires

I. Contractors Oriented Questionnaire

This questionnaire aims to collect data from contractors' point of view. It was distributed among contractors of grades I, II and III all situated in the Eastern Province of Saudi Arabia.

The questionnaire form is covered with a letter that illustrates the main objectives of the research. Also, the cover letter concludes the impact of the research results on the current financial applications, and, the need for new financial models. At the end of the cover letter, the researcher profile and contact information is provided in case the respondent finds the need for any clarification regarding answering the questionnaire.

The questionnaire questions were answered by the respondents passing through the following parts:

1. Organization Profile

This part represents the data related to the contracting organization itself. In this section, data which may aid in describing the contracting organization was pursued. Data such as the contracting firm size, the amount of current projects, the age of organization are introduced in this part.

2. Respondent Profile

This part of the questionnaire was introduced to seek information about the respondent himself. Data such as the experience of the respondent, his position in the organization, his educational level, etc., were collected from the answers of this section.

3. Financial Transactions and Cash Flow Management

This part of the questionnaire seeks data related to the characteristics of cash flow operations that the firm experiences along the course of its projects. Data such as the project expenses, the owner payments, the cash flow characteristics, etc., were collected at the end of this section.

4. Current Applied Financial Techniques

In this part, the respondent is asked questions related to the current applied financial techniques used by his organization. The usage of these techniques, and the value in which they are applied, are the type of data which were collected at the end of this section.

In this part, also, the respondents were asked questions that helped in gaining insight into the difficulties the respondent's firm encountered in the application of its own financial techniques. The respondents were asked to evaluate factors that could impact project financing by the degree of their severeness. Additionally, respondents were asked to highlight the major obstacles faced in financing their projects.

Moreover, this part aided in assessing the current financial techniques applied by the contractor. The respondents were asked to evaluate these financial techniques in terms of their suitability and sufficiency in fulfilling the firm's requirements, the parallel cost which would result by applying these techniques, and, the risk involved in applying these financial techniques

5. Proposal for New Financing Technique

The last part of this questionnaire provided an opportunity for the respondents to propose for a new financial technique\method that they find more suitable for their respective firms. Further, this section provided space for proposals aimed at enhancing the current financial techniques

II. Banks Oriented Questionnaire

This questionnaire aims to collect data from Banks' point of view. It was distributed among banks in the Eastern Province of Saudi Arabia.

The questionnaire form is covered with a letter that illustrates the main objectives of the research. Also, the cover letter concludes the impact of the research results on the current financial applications, and, the need for new financial models. At the end of the

cover letter, the researcher profile and contact information is provided in case the respondents require any clarification regarding answering the questionnaire.

The questionnaire's questions were answered by the respondents passing through the following parts:

1. Bank Profile

This part represents the data related to the bank profile. In this section, data which may aid in describing the bank was pursued. Data such as the bank size, the size of services introduced by the bank, the age of bank organization, etc., were introduced in this part.

2. Respondent Profile

This part of the questionnaire was introduced to seek information about the respondent himself. Data such as the experience of the respondents, their position in the organization, their educational level, etc., were collected from the answers of this section.

3. Offered Banking Facilities

This part contains questions that seek information about the available banking facilities that the bank offers for its clients. The respondents were asked to identify the contractors' utilization of these facilities, and, their purposes behind the utilization of these techniques.

4. Requirements for Obtaining Banking Facilities

This part represents a list of requirements\securities that a bank may request a contractor to provide in order for the former to facilitate the latter with the appropriate financing needed to run a project. The respondents in this section were asked to define

the degree of importance of each requirement to be provided by the contractor, so, he will be able to obtain a banking facility from the bank.

5. Encountered Problems after Facilities Approval

In this part, the respondents were asked a question that helped in understanding the difficulties that a respondent's bank encounters when offering its banking facilities. The respondents were asked to show whether they agreed or not with the listed problems.

6. Reasons for Rejecting a Contractor's Application for a bank facility

The last part of the questionnaire asked a question that aided in unearthing the reasons that a banking facility request may be rejected. The respondents were asked to show their level of agreement with the reasons which were listed in the question.

3.3.2.3 Method of Collecting Data

The previously described questionnaires were distributed in two directions, contracting firms and banks. Either by sending them to the intended respondent in a soft copy format by email or in a hard copy format by hand. In some cases, personal interviews with certain respondents were conducted in order to collect the required data.

3.4 Population and Sample Selection

Population can be defined as the set of objectives which is intended to be studied by a research in an illation procedure (Taylor, 2014). In this research, two populations

were studied to conclude the results and recommendations of the research. The first population was the set of contracting firms in the Eastern Province, those of grade I, II and III. According to Ministry of Municipal and Rural Affairs, there are 86 contractors who fall in these grades in the Eastern Province. In particular, there are 18 contracting firms of grade I, 28 of grade II and 40 of grade III. On the other hand, the second population was the set of commercial banks located in Eastern Province. The chamber of commerce branch in Eastern Province listed 12 banks as commercial banks located in Eastern Province. These banks are listed as follow:

- | | |
|-------------------|------------------------------|
| ▪ Al Inma Bank. | ▪ Bank Albilad. |
| ▪ Al Rajhi Bank. | ▪ Arab National Bank. |
| ▪ SAMBA. | ▪ The Saudi Investment Bank. |
| ▪ SAB Bank. | ▪ Saudi Hollandi Bank. |
| ▪ Al Riyadh Bank. | ▪ Banque Saudi Fransi. |
| ▪ Al Jazira Bank. | ▪ National Commercial Bank. |

The reliability of the sample size as a representative of the population being studied, i.e. the sample size which reflects the population behavior, was determined using the following equations (Kish, 1995):

$$no = \frac{p(1 - p)}{E^2}$$

$$n = \frac{no}{1 + \frac{no}{N}}$$

Where: no= sample size from infinite population.

n= sample size.

p= targeted proportion from population.

N= population size

E= maximum standard error considered.

Considering the previous equation, and for 10% error and 50% targeted proportion, it can be stated that the reliable sample sizes for the two populations: contractors and banks, should be within the following ranges:

1- Contractors' sample size ≥ 20 contractors.

2- Banks' sample size ≥ 9 banks.

3.5 Data Analysis

After collecting the data using the described questionnaires, the obtained data were analyzed to produce the conclusions and recommendations in terms of highlighting the current applied financing techniques by contractors in Eastern Province, assessing the performance of these techniques, showing the difficulties that contractors and banks encounter by applying these techniques and finally, discovering the characteristics of the financial technique that contracting firms wish to apply in financing their projects.

Using statistical tools and software, the collected data were processed and then, the results were presented using tabulated and graphical format.

Finally, the research led to an enhanced understanding of the current status of financial management in Saudi Arabia. The results aided in evaluating the most suitable financing techniques for contractors and highlighting their characteristics. Also, the findings helped in bridging the relationship between contractors and commercial banks in order to improve the financial transactions that they may share between each other. This research is hoped to be the first step in establishing better financial structure for contractors in Saudi Arabia.

CHAPTER 4

RESULTS ANALYSIS

This chapter presents the results of the analysis of the collected data in the process of achieving answers to the questions which are being targeted by this research. Along with highlighting the research findings, they will be clarified either by linking them to previous studies and researches, or, by judging them under a personal and practical judgement by the researcher. It should be noted that the results and findings below are built considering 25 contracting organizations out of the total of 86-contractor population. On the other hand, 9 banks responded out of 12.

4.1 Respondents' Characteristics

This section represents the characteristics of the organizations which responded to the survey questionnaires. Moreover, it presents the profile of the respondents who completed the questionnaire. As there are two different oriented questionnaires, both contracting firms and banks' profiles are discussed in this section.

4.1.1 Contractors

Out of the targeted 86 grade I, II and III contractors in Eastern Province (the Population), a sample of 25 contractors participated by responding to the contractors'

oriented questionnaire. Referring back to the minimum reliable sample size demonstrated in Section 3.4, a sample of 25 contractors is considered reliable and eligible to reflect the contractors' population's characteristics. The characteristics of those contractors and their key informants are discussed in this section.

4.1.1.1 Organizations' Profiles

The results indicated that the participating contractors have been in existence in the market for a different number of years. A relatively high percent of the participants (64%) have an experience in the market for more than 10 years. Obtaining the required information from such experienced contractors, definitely, improves the reliability of the results. The existence of such type of contractors, also, adds informative value to the results as it presents different types of data which should be taken into consideration during the data analysis process. Figure 4-1 shows the contractors' experience distribution. It is interesting to notice that 20% of the participated contracting firms were established less than 5 years ago. These firms could be joint ventures with proper capabilities and experiences.

Also, it was found that the contracting firms' age and their number of employees are significantly correlated. For contractors with less than 5 years' experience in the market, the number of employees is below 50. Those contractors represent 20% of the total participants. On the other hand, 32% of the participating contractors employ more than 1000 employees and 40% have between 50 and 500 employees.

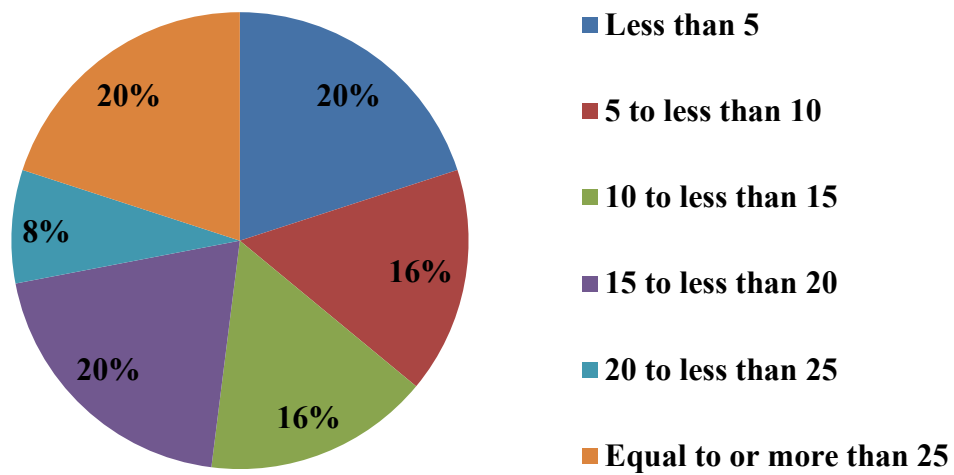


Figure 4-1: Contractors' Organizations Age (years)

The results indicated that 37.5% of the participating organizations sign yearly contracts with an average amount between 100 million SAR and 200 million SAR. Also, the results showed that there was a significant portion of participants (about 29%) who sign contracts with an average amount of more than 700 million SAR yearly. This combination of different values of the undertaken projects by the participating contractors is a good factor to improve the quality of results as it provides a wider view of the research findings. It was noticed also that there is no association between the contractors' undertaken yearly contracts amounts and the size of the contractors' capital. Actually, the organization capital gives no real picture about its size. Many respondents clarified this issue by demonstrating that the documented capital for the organization is just a dummy number which is not related to the actual size of the contractor or his capability.

The results indicated that the majority of the participating contractors are building contractors. That is, the main source of their contracts comes under the category of 'Building Construction'. These types of projects comprised the majority of the projects executed by these firms and consequently dictate their survival in the market. However, a significant portion of participating contractors indicated that they execute industrial, infrastructures and utilities projects as shown in Figure 4-2 .

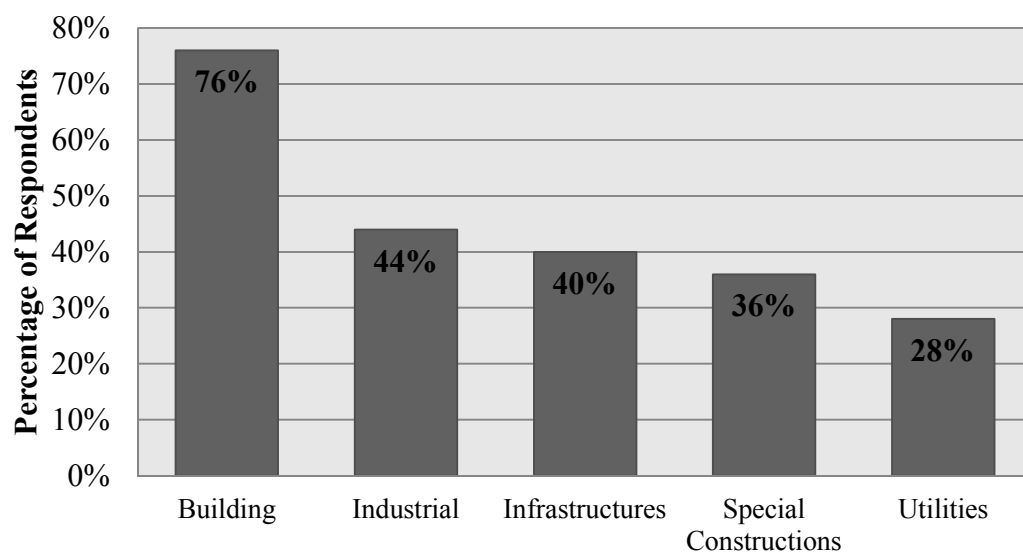


Figure 4-2: Distribution of Construction Projects' Types

Finally, the results indicated that most of the participating contractors have their head offices situated in Dammam and Al Khobar. On the other hand, few of the participating contractors have their head offices in other cities like Riyadh and Jeddah. However, all of the data were collected from participant's offices located in the Eastern Province.

4.1.1.2 Respondents' Profiles

As mentioned in CHAPTER 3, the key personnel providing the necessary data for the research questionnaire must either be one of the top management personnel for the construction department or finance department. The results indicated that, almost half of the respondents hold one of the top management positions in the construction department in their organizations, i.e. general managers, operations managers, projects managers and directors. On the other hand, about one third of the respondents are managers and managers' assistants in the finance departments of their organizations. It was also noticed that, in some organizations, the key personnel holds a high position in the estimating department of their respective companies. In general, the key informants differed from one firm to another depending on the internal policies of the firm which control the flow of information and gives authorities to specific personals rather than others. For instance, there were two respondents who are project engineers in their organizations, but were involved in the financial transactions of their companies. Collecting the necessary data from such calibers with this valuable experience in financial issues, definitely, assures confidence in the quality of the information, and, hence, the obtained results and findings.

The results indicated that the personnel who completed the contractors' oriented questionnaire hold at least a bachelor degree in their area of experience. One half of the respondents hold higher education certificates, i.e. master degree and doctorate of philosophy in their field of experience.

As the main purpose of this questionnaire was to collect data concerning the financial transactions which take place in the construction field, it was important to know

if the respondents possessed any financial background from an academic perspective. The results indicated that about 63% of the respondents were educated in finance management while the remaining attained their knowledge in finance management through practical implementation of its principles in the construction market.

The results indicated that the respondents have different levels of experiences as measured by the number of years they have been in the construction industry. Particularly, 54% of respondents were found to have more than 10 years' experience in the construction field respectively. Figure 4-3 shows the distribution of the respondents' experience.

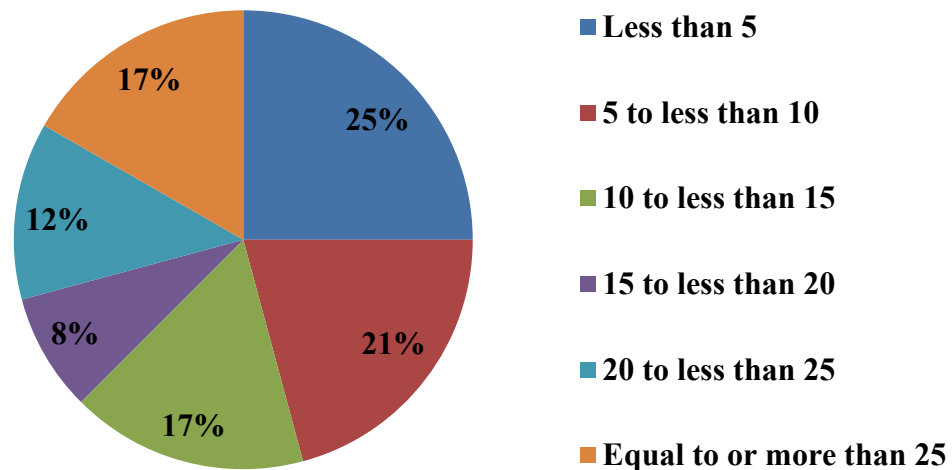


Figure 4-3: Contractors' Experience in Construction Field (years)

Regardless of the total experience that the respondents have, the results indicated that 50% of them have been holding their current positions for less than 5 years, and, the majority of the remaining respondents have been in their current positions for a period of more than 5 years, but less than 15 years.

The results indicated that about 46% of the respondents have been in their current organizations for less than 5 years, and, about 50% of them have been working more than 5 years, but less than 15 years in their current organizations. A significant correlation was found between the respondents' experience in their current positions and their experience in their current organization. In other words, the shared experience by the respondents reflects the financial operations in a certain organization. This will enhance the quality of the obtained results as the respondents' information can be linked to specific organizations' characteristics.

4.1.2 Banks

Due to the increase in oil demand during 1950's, Saudi's production of oil rapidly increased. This caused a huge swelling in the Saudi economy during that same period, Unfortunately, financial services applied during those times of rapid growth were not sufficient to accommodate the economic expansion. As a result, in a bid to help mitigate this problem, the Saudi government started giving banking services companies permissions to establish their business in the kingdom (M.A., 2004).

In 1926, the first banking services were offered by the Holland Commercial Company, which was established to serve pilgrims by offering them what was referred to as 'Haj checks' (Bank History, 2013). After 22 years, the first bank was established in the kingdom. The Palestinian bank, Arab limited bank opened its doors in Jeddah in 1948 to implement the basic banking services. In 1979, this bank was officially registered as a Saudi listed joint stock Company with its current name, Arab National Bank (About Us,

2014). In the early 50's, the Saudi Arabian Monetary Agency (SAMA) was established to found the first principles of the banking regulatory structure.

Out of the targeted 12 banks in Eastern Province (the Population), a sample of 9 banks participated by responding to the banks' oriented questionnaire. Referring back to the minimum reliable sample size demonstrated in Section 3.4, a sample of 9 banks is considered reliable and eligible to reflect the banks' population's characteristics. The characteristics of those banks and their key informants are discussed in this section.

4.1.2.1 Banks' Profiles

The results indicated that most of the participating banks (78%) are national banks, and the remaining are international banks. All banks' headquarters are located in the kingdom capital, Riyadh, with more than 50 branches operated by more than 400 employees all over the kingdom. The capital of these banks, as indicated by the results, exceeds 100 million SAR.

The results also indicated that these banks have been in the existence in the Saudi market for more than 25 years. Valuable information has been obtained by involving such experienced banks in the study. For instance, the participation of the first bank established in the Kingdom, Arab National Bank, add a significant improvement to the quality of the obtained results and findings.

It can be summarized that, the banks in Saudi Arabia have almost the same characteristics. This guarantees that the obtained results and findings represent similar environments.

4.1.2.2 Respondents' Profiles

The results indicated that the majority (78%) of the personnel who completed the banks' oriented questionnaire hold a bachelor degree in their area of experience, while the remaining 22% of the participants are certified as master degree holders. The participation of such high level educated personnel assures high quality results and findings.

The results indicated that about 44% of the respondents have the knowledge of construction projects development. When asked about the source from where they gained this knowledge, they stated that they had an experience in the construction industry. The existence of this significant percent of respondents who have an experience in the construction field improves the results of the research and enhances the reliability of the findings as the main purpose of the research is to study the financial applications in the construction industry.

The results revealed that the respondents have different levels of experience in the banking industry. They have experience levels which are almost equally distributed in the range between 5 and 25 years as shown in Figure 4-4.

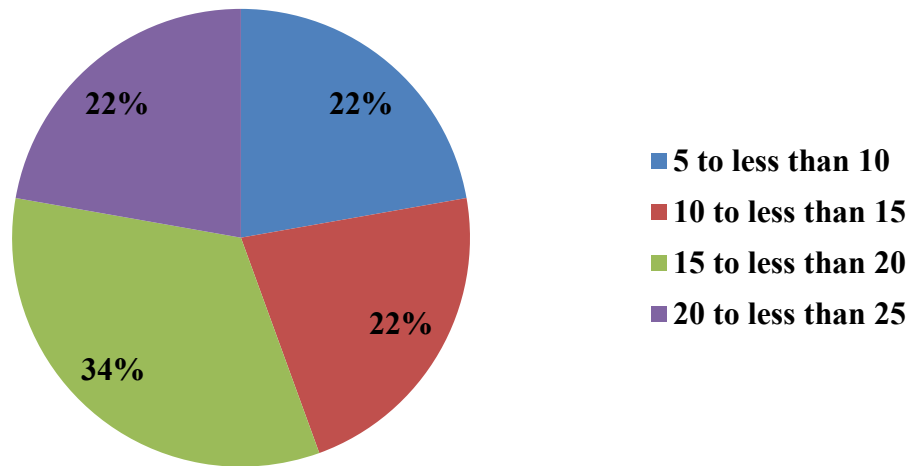


Figure 4-4: Banks' Experience in Banking Industry (years)

However, the results also indicated that 50% of the respondents have an experience in the banking facilities department for more than 15 years and less than 20 years. The majority of the participating respondents (62.5%) served more than 25 contractors over their years of experience.

Moreover, 50% of them processed more than 75 banking facilities during their working period. The results also indicated that, only 4 out of 9 respondents mentioned their positions in their banks. The majority of the respondents were managers and heads in their banks.

We can conclude from this overview that, the key personnel who responded to the banks' oriented questionnaire have a rich experience which served the research by improving the quality of the obtained information, and, hence, the reliability of the results.

4.2 Financial Transactions and Cash Flow Management

To understand the different principles of financial management of construction projects, the components of the financial structure of these projects should be well defined. This section discusses the financial transactions which take place during the execution of a construction project. Hence, it describes the types of cash inflow and cash outflow for contractors, and how contractors manage this cash. This section, in addition, describes the sources of the cash inflow, as well as, the destinations of the cash outflow. Finally, it provides an overview for the management tools applied by contractors to control and operate their financial transactions.

4.2.1 Cash Outflow Components and Methods of Funding

As discussed in the literature review, cost is one of the main components of the financial body of a construction project. The types of costs items which are incurred in a construction project can be categorized as direct costs and indirect costs. Actually, in the construction industry, the direct cost is the cost that needs to be strictly managed to keep the financial status of the project in a good shape. This is because, direct costs, which are the costs acquired due to the physical execution of the project elements, comprise the highest percentage of the total project cost. Direct costs, as was mentioned before, can be labor's wages, materials, subcontractors, etc. (Halpin & Senior, 2009).

On the other hand, another type of cost materializes during the developing phases of a construction project. Costs which are associated to the project execution, and, company development as well, referred to as overhead. Overhead is categorized under the

indirect costs, which are the costs that cannot be traced to a certain project element. Overhead can be divided into two types: field\project overhead and home office\general overhead. The field overhead is the one which is incurred due to the project supporting activities. Site office costs, site engineers' and staff salaries, are examples of this type of cost. At the company level, the costs generated by the management and administrative activities can be defined as general overhead. Unlike direct costs, the indirect costs associated to construction projects have relatively low percentage of the total project cost. Usually, overheads account for less than 5% of the total project cost (Halpin & Senior, 2009).

The contractors that participated in the research revealed the cost distribution of all the undertaken projects. Included in these cost distributions were materials, labors, equipment, subcontractors, and overheads. These items were identified as the primary source of cash outflow. These cost items' descriptions are presented in the following sections:

4.2.1.1 Materials

The results indicated that the majority (44%) of the participating contractors reported that the cost of materials in their projects is between 30% and 50% of the total project cost. However, it should be noted that sometimes the scope of the contractor's work differs from one project to another depending on the project contract. For instance, in some contracts the contractor is responsible to supply all or most of the project

materials, while in other contracts, the owner participates in providing a significant portion of the materials. This was clear from the answers furnished by the remaining participating contractors where 30% of them reported that materials cost comprised between 50% and 70% of the overall project cost, and another 13% of them reported that materials cost comprised between 20% and 30% of the total project cost. In general, the former percentage figure for the materials cost coincided with what was reported by many researches, that the contribution of materials cost in construction projects usually ranges from 30% to 50% of the total project cost (Ross & Williams, 2013). On the other hand, some contractors (4%) indicated that the materials costs comprise less than 20% of their total projects' costs. Actually, by reviewing the latter's profiles, it was observed that the services offered by these contractors are limited to industrial equipment installing and operating services. On the other extreme, a percentage of the contractors (9%) stated that the materials cost them more than 70% of the total project cost. Again, like the previous contractors, the nature of the projects undertaken by these contractors was the reason behind this high percentage. Reviewing the types of their projects, it was noticed that these contractors construct special structures such as rail ways and precast concrete buildings. In these type of special structures, the materials have a very high portion of the total projects cost. Figure 4-5 shows how the respondents estimated the amount of materials cost as a percentage of the total project cost.

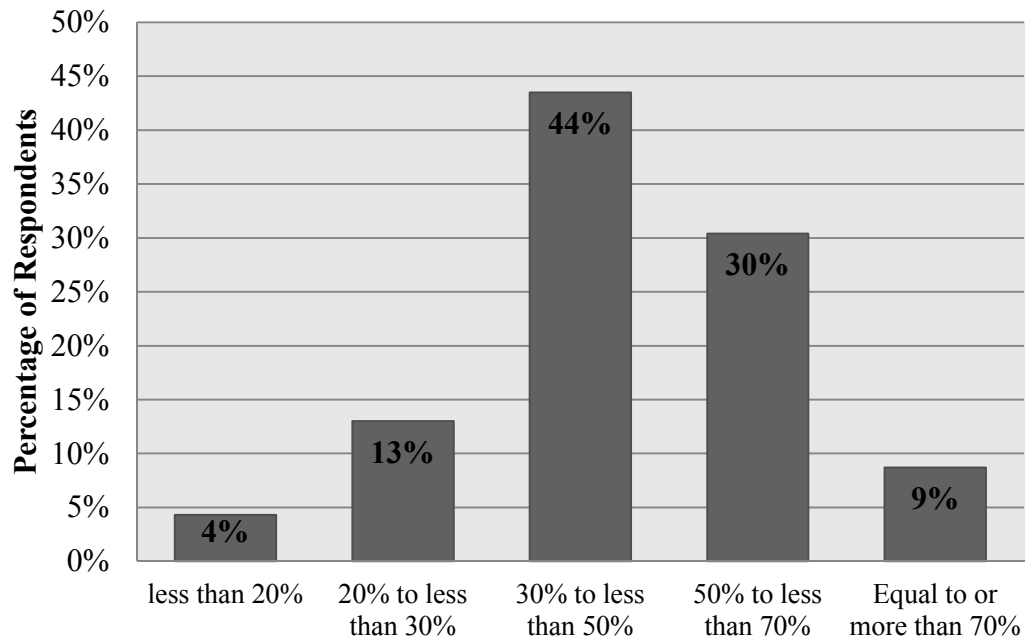


Figure 4-5: Percentage of Materials Cost of Total Project Cost

The participating contractors indicated that they pay materials suppliers using different a combination of various techniques. The results indicated that the majority (56%) of the participating contractors use credit financing as one of the sources to pay for materials cost, while 44% and 48%, respectively, of the participating contractors use progress payments and advance payments to pay materials suppliers. The results also indicated that only 16% of the contractors pay the suppliers from their own accounts. It seems that the contractors value the importance of punctual availability of materials and, hence, rely less on limited sources to fund this cost item. Figure 4-6 shows the distribution of the different financing techniques used by contractors to pay for materials cost.

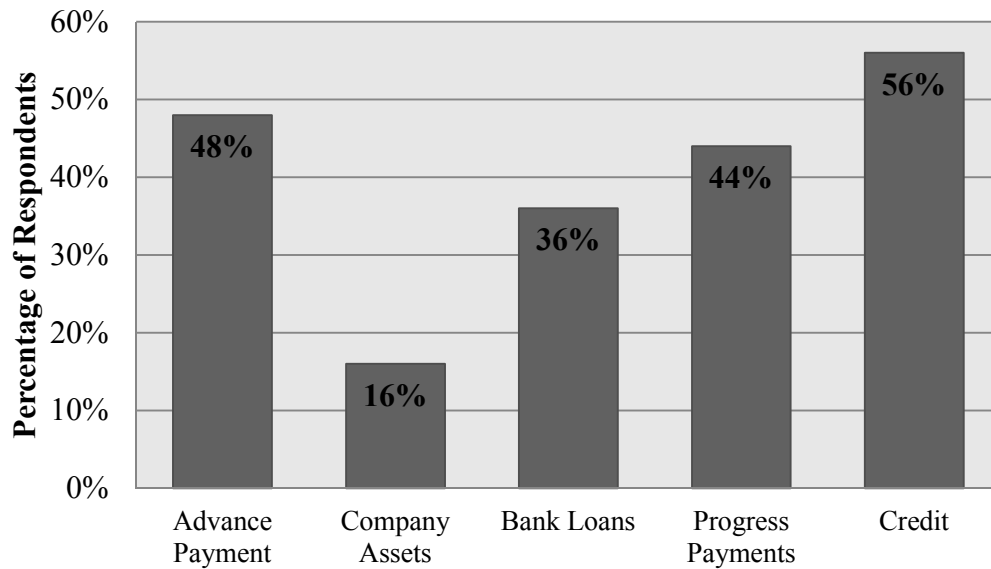


Figure 4-6: Materials Cost Financing Sources

Describing the above findings, it is a common practice for contractors to pay materials suppliers by credit. Paying by credit means to pay for the delivered material after a certain period of the delivery date, usually 30 days. By applying this technique, the contractors can gain time until the owners pay them against the incurred materials cost. Consequently, they will reduce the amount of overdraft. To be able to open a credit account, the contractors are required to prove their worthiness and trust to suppliers (Ross & Williams, 2013).

4.2.1.2 Labors

Labors' wages are considered critical factor in estimating the total project cost. The results indicated that the majority of the participating contractors (83%) reported that

the labors' costs in a construction project comprise less than 30% of the total project cost as shown in Figure 4-7.

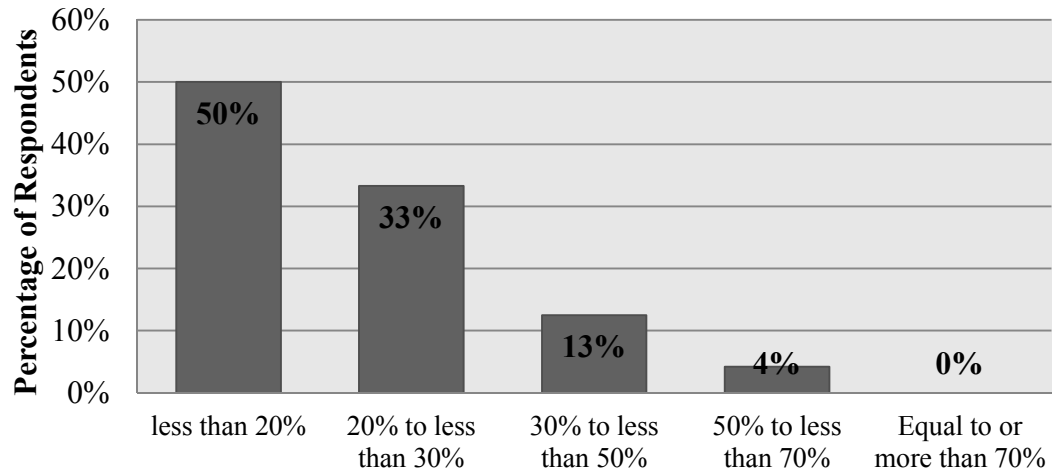


Figure 4-7: Percentage of Manpower Cost of the Total Project Cost

This relatively low percentage of labors cost is owing to contractors' tendency to minimize the value of this cost item by hiring workmanship subcontractors to execute most of the project elements instead of employing their own labors, even though labor cost might be minimized by hiring foreigner labors from certain countries. However, due to the criticalness of labors' productivity, it is costly for contractors to keep monitoring and controlling the labors' production rate. Given all this trouble of maintaining a workforce, the contractors resort to hiring subcontractors to execute certain packages of a project and, hence, specify an execution period in the contracts between them and the subcontractors. In general, the percentage of the labors cost is estimated to be 30% of total project cost (Ross & Williams, 2013), which is compatible with the previously mentioned results. However, few of the participating contractors (4%) reported that the labors cost comprises between 50% and 70% of the total project cost. This can be

explained by the fact that in some contracts the owner is the one who is responsible for supplying most of the materials for a project, thus, the scope of the contractor in these contracts is mainly limited to providing the needed manpower for the project. In these types of contracts the manpower cost is the major part of the project cost.

The results indicated that the majority (more than 50%) of the participating contractors showed that they mainly pay their labors from the company owned cash, as well as the progress payments paid by the project owner. This coincides with the concept of paying the manpower on monthly basis as a must. In fact, it appeared that the contractors understand the importance of paying their labors on time as they allocate these continuous funding sources to serve them in paying their labors. Otherwise, the project's activities will be significantly affected. Figure 4-8 shows the distribution of the different financing sources applied by contractors to pay manpower cost.

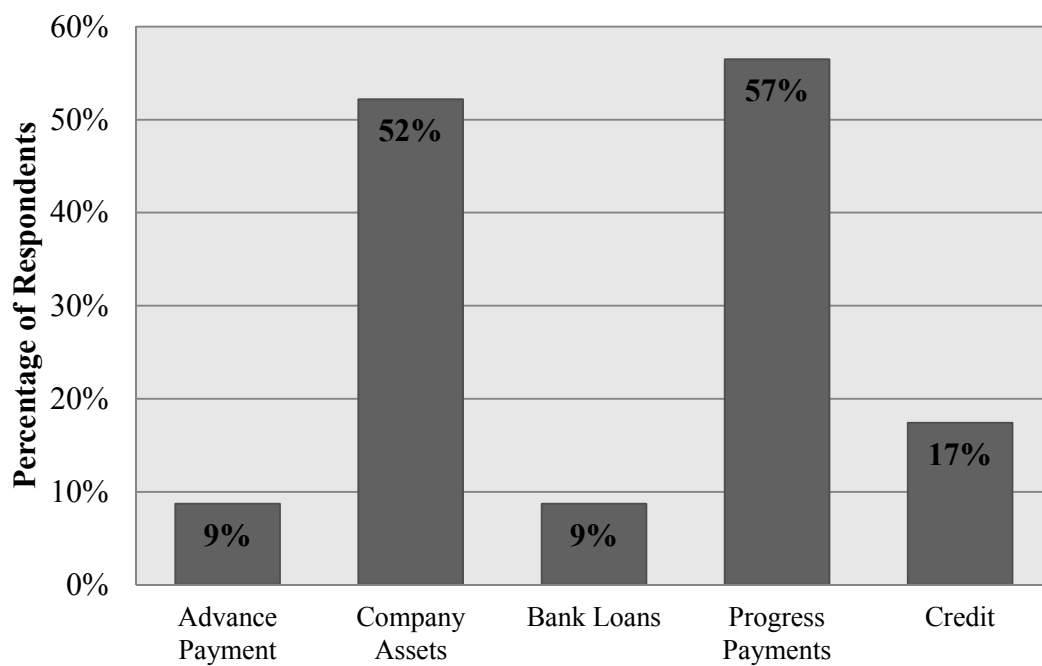


Figure 4-8: Labors Cost Financing Sources

4.2.1.3 Subcontractors

The results indicated that the majority (78%) of the participating contractors reported that the subcontractors are usually paid an amount that ranges between 20% and 50% of the total cost of the project that they have worked on. However, as it is shown in Figure 4-9, this amount of subcontracted work cost may differ from one contractor to another depending on the organization policy and limitations regarding the amount of the subcontracted work and the subcontract conditions (for example, including materials supplying or not).

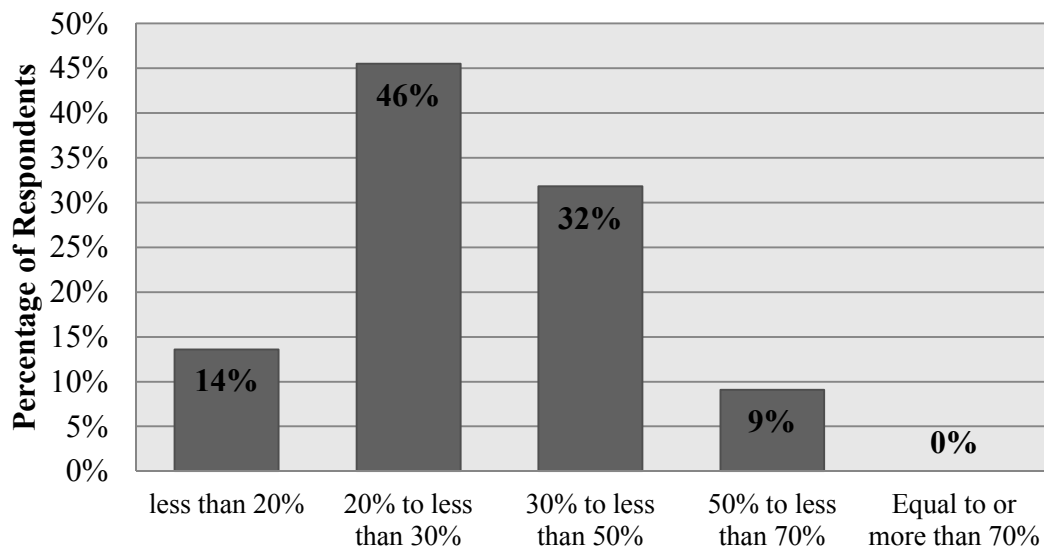


Figure 4-9: Percentage of Subcontracting Cost of the Total Project Cost

The results also indicated that 58% of the participating contractors pay their subcontractors using owners' progress payments, while 37.5% of the participating contractors reported that they use banks' loans and advance payments to pay subcontractors. Moreover, the results indicated that a reasonable portion of the participating contractors are committed to pay their subcontractors on time, as there is

only about 21% of the contractors that keep their subcontractors as creditors as shown in Figure 4-10.

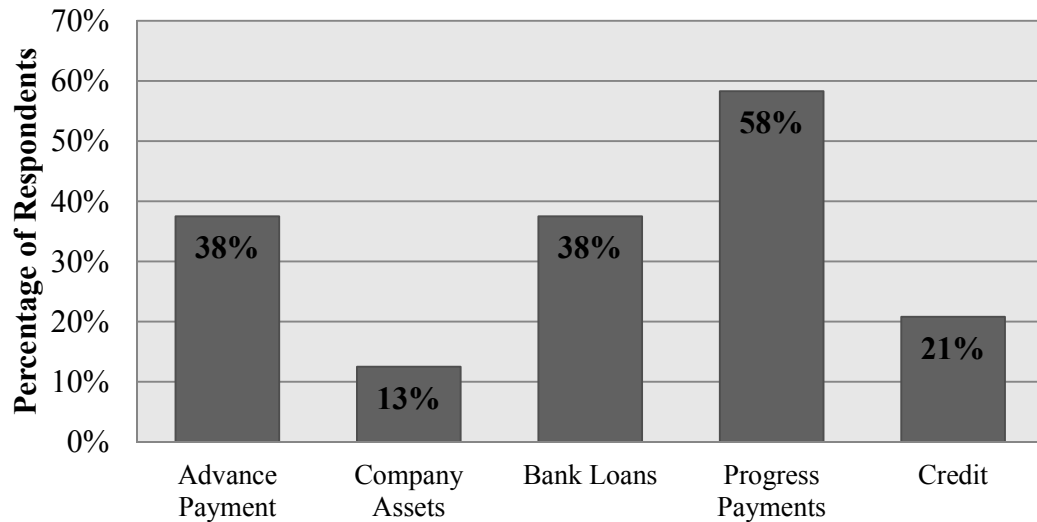


Figure 4-10: Subcontracting Cost Financing Sources

Commonly, subcontractors are paid on monthly basis by considering the amount of work executed by them in the preceding month (Ross & Williams, 2013). This can explain why contractors rely mainly on the progress payments and banks loans to pay for subcontractors.

However, some studies showed a different behavior in paying the subcontractors when they stated that what happens in reality may be different as the contractors sometimes do not pay the subcontractors unpaid until the contractors themselves receive payments from the project owner. This practice is called ‘pay-when-paid’ (Ross & Williams, 2013). Actually, unless there is a good relation between contractors and subcontractors, this can lead to many problems which may affect the project development. As mentioned previously, the contractors seem to be aware of the

importance of having a good relation with the subcontractors as they try to allocate sufficient sources of fund for them and retain the least possible credit in the subcontractors' accounts.

4.2.1.4 Equipment

A high portion of the participating contractors, almost 83%, reported that the equipment cost comprises less than 20% of the total project cost. While about 8% only voted for an average equipment cost between 50% and 70% of the total project cost as shown in Figure 4-11. Actually, as the nature of the undertaken projects by the different contractors vary, it is sensible to have such a high variance in the values of the equipment cost, i.e. most of the participating contractors construct buildings which are labor intensive rather than equipment intensive, however, there are some contractors who undertake projects which depend mainly on providing special types of equipment which are associated with high cost.

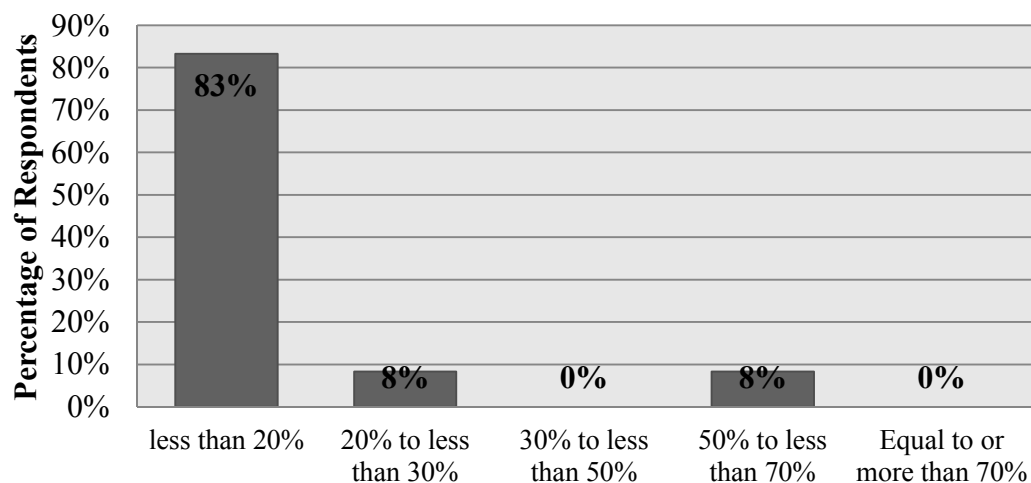


Figure 4-11: Percentage of Equipment Cost of the Total Project Cost

The results indicated that the majority (60%) of the participating contractors use the company assets to pay for the equipment cost. Besides using company assets to fund the equipment cost, 24% of the participating contractors reported that they use credit financing. The use of credit financing technique was found to be most effective when the equipment were rented for short term activities (Ross & Williams, 2013). On the other hand, the results indicated that 36% of the participating contractors use the progress payments to pay for the equipment expenses. Actually, this funding source is applicable when the contractors may rent the equipment for a long time. Thus, in this case the contractors will pay for the hired equipment by installments according to the conditions of the agreement between the contractors and the equipment suppliers (Ross & Williams, 2013). Figure 4-12 represents the different funding sources applied to pay for equipment costs in construction projects.

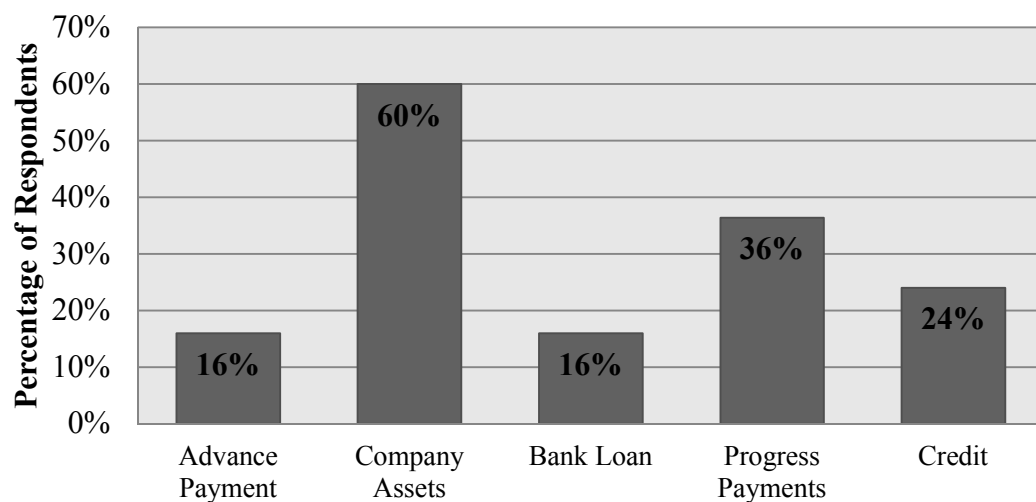


Figure 4-12: Equipment Cost Financing Sources

It is believed that this variety of financing methods used to pay for equipment cost in construction projects stems from the above mentioned scenarios of applying equipment

in construction industry. Some equipment may be rented for a brief period which makes it easy and more cost effective to be paid using the company assets. Also, the monthly payments between the contractors and the equipment suppliers that is usually agreed upon, forces the contractors to share the progress payments they receive from the owner with these suppliers. However, the credit financing still seems to be a useful financing tool for financing this cost item.

4.2.1.5 Mobilization

The results demonstrated, as shown in Figure 4-13, that 87% of the participating contractors reported that mobilization costs usually account for less than 3% of the total project cost. This is reasonable as the mobilization costs for any project start up activities can be considered as part of the project overhead costs.

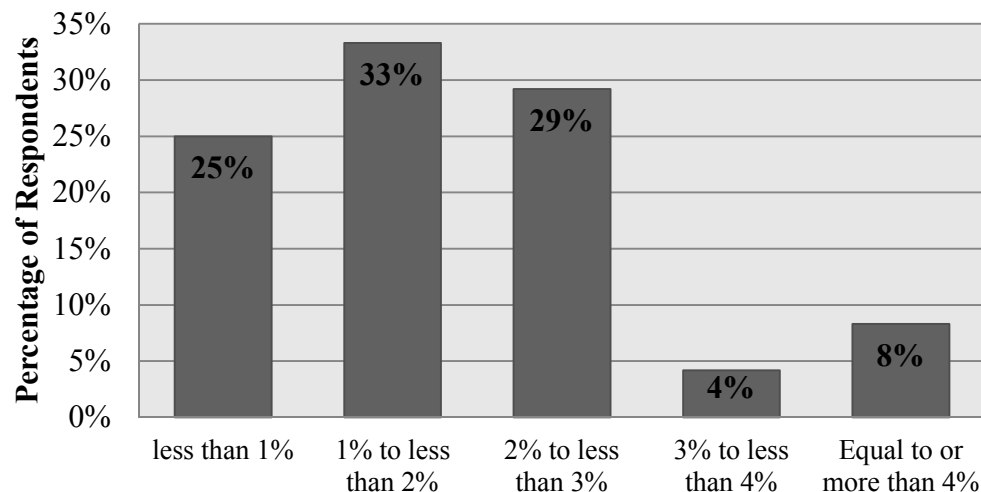


Figure 4-13: Percentage of Mobilization Cost of the Total Project Cost

The results also indicated that the majority (80%) of the participating contractors pay for the mobilization costs using the advance payments paid by projects' owners. Actually it has become accepted as a fact, that the contractors at the beginning of the project need this financial energy to provide the necessary facilities that will support the construction process. However, 44% of the participating contractors reported that they use their own cash to liquidate the mobilization costs. This is applicable once mobilization costs take place in later stages of the project. Sources of financing mobilization cost are represented in Figure 4-14.

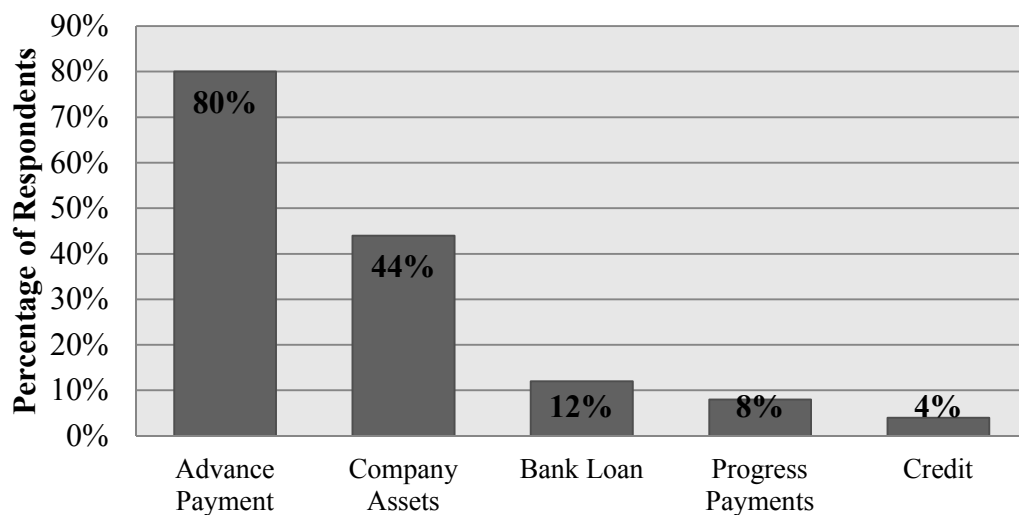


Figure 4-14: Mobilization Cost Financing Sources

4.2.1.6 Overhead

The results indicated that about 88% of the participating contractors stated that the project overhead cost is less than 10% of the total project cost. Identically, about 80% of

the participating contractors indicated that general overhead cost is less than 10% of the total project costs (see Figure 4-15 and Figure 4-16). However, other contractors reported that the overhead costs barely reach 30% of the total project cost.

As it was mentioned previously, overhead can be directly related to a certain project ‘project overhead’, or can be generated due to the head office operations of the contracting firm which is called ‘General Overhead’. In general, the percentage of overhead costs is less than 5% of the total project cost (Halpin & Senior, 2009). This is highly conformable with what was delineated by the contractors as mentioned above.

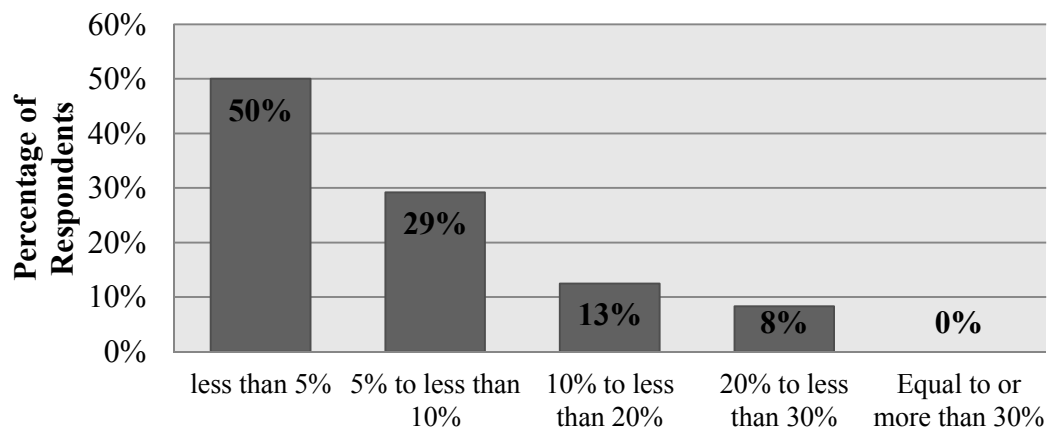


Figure 4-15: Percentage of General Overhead Cost of the Total Project Cost

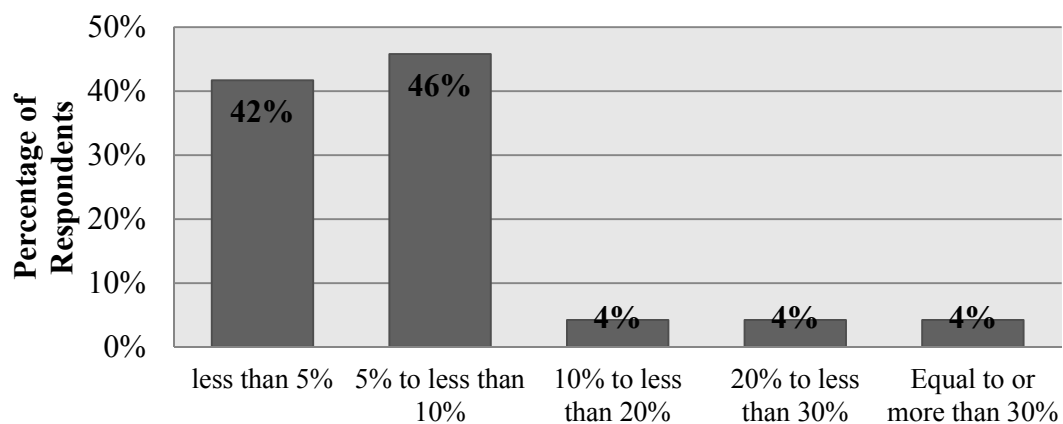


Figure 4-16: Percentage of Project Overhead Cost of the Total Project Cost

The results indicated that more than half of the participating contractors apply both, company assets and progress payments to fund their management expenses. This indicates that the overhead expenses don't need a special source of fund as their amounts are relatively small which make it easy for contractors to pay these expenses without needing any external aid. Figure 4-17 shows how the contractors utilize the different financing sources flexibly to fund overhead expenses.

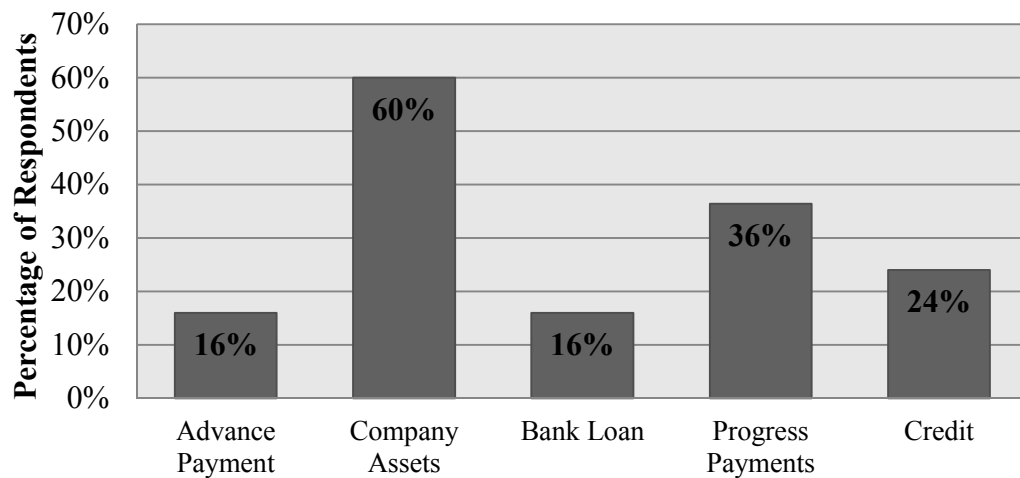


Figure 4-17: Overhead Cost Financing Sources

Moreover, Table 4-1 shows that the participating contractors indicated that the direct costs are the major components of the total project cost. They reported that the direct cost comprises 88% of the total project cost, while the indirect costs comprise only about 12% of the total project cost. In addition, studying Table 4-1 revealed an interesting observation; the contractors don't depend on banks' loans as a major finance source for any cost item. Although bank loans have a significant share of financing many cost items, the contractors showed that they prefer to have stable sources of fund to liquidate their projects.

Table 4-1: Cost Items Amounts and Finance Sources

Cost Category	Cost Items	Approximate Average Percentage of Total Project Cost (%)	Major Finance Source
Direct Cost	Materials	43%	Credit
	Equipment	10%	Company Assets
	Manpower	15%	Company Assets
	Subcontractor	20%	Progress Payments
Indirect Cost	Mobilization	2%	Advance Payment
	Overhead	10%	Company Assets

Summarizing all the above described information about the percentages of the different cost items out of the total project cost and the applied sources of fund by the contractors to finance these cost items, Figure 4-18 clarifies how the contractors manage the different cost items in their project from a financial perspective.

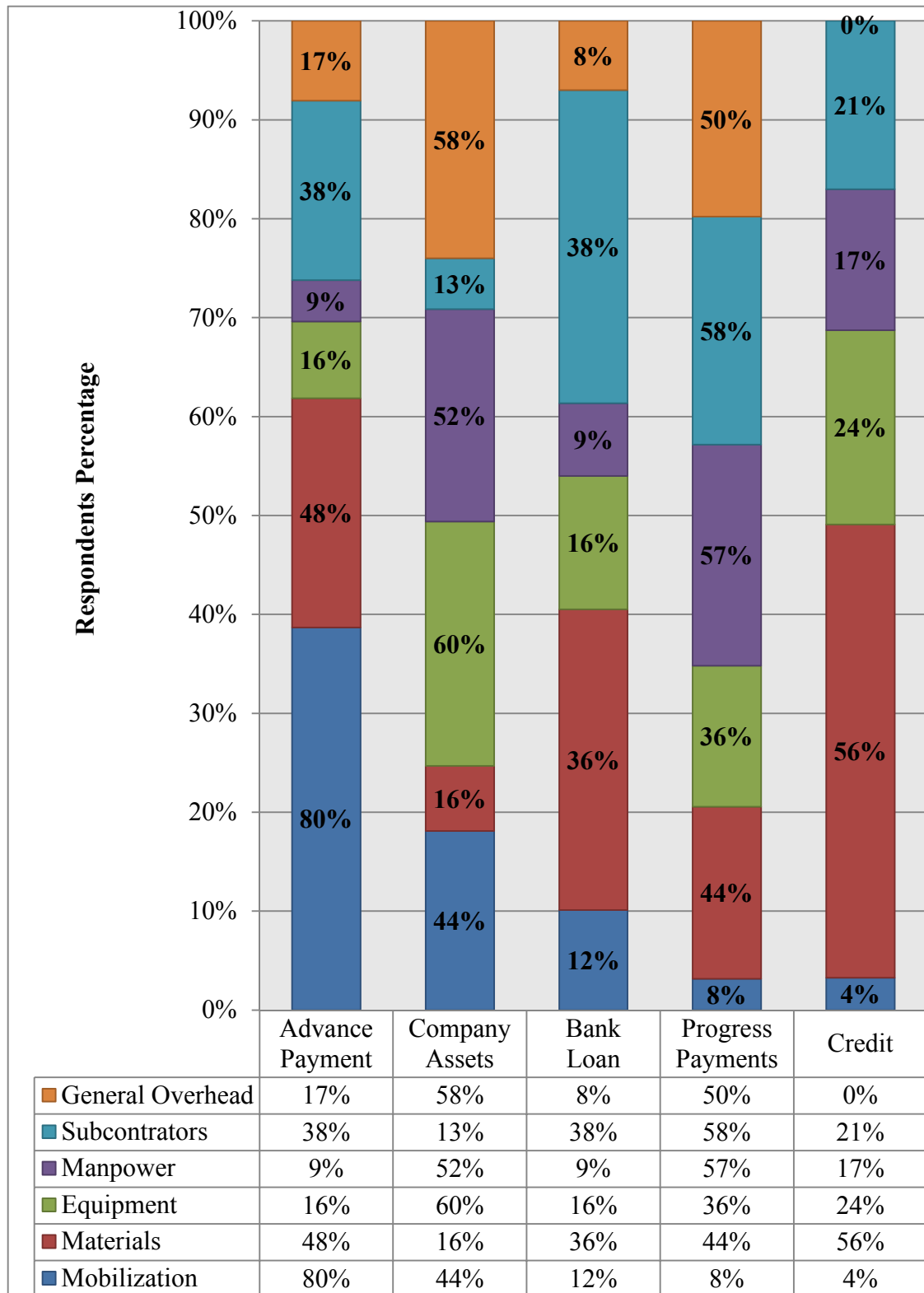


Figure 4-18: Sources of Finance against Different Cost Items

4.2.2 Cash Inflow Description and Sources

Construction industry, as was described previously, has its own characteristics, which makes it different from other types of businesses. Accordingly, the financial transactions occur during the development of a facility have also their own characteristics. The developers of this business sector used to deal with credit system in their financial transactions. As the construction facility will not be delivered to the client in an instant, the client as well will pay for every part of the facility continuously while it is in the process of being executed. This type of payments is called progress payments, or paying by installment. This method of paying the construction expenses will also impact the way that the contractor pays suppliers, subcontractors and labors. In general, the idea behind this credit system is to establish a system that enables the owner to pay the project expenses in a way that support the contractor effectively while concurrently securing the owner (Ross & Williams, 2013).

Whatever the cost of the project may be, the main concern for any contractor is to minimize his out sourced financial aids as much as possible. In other words, a contractor's goal is to achieve minimum possible value, thus, his loans cost will be the least (Halpin & Senior, 2009)

The types of owner payments take different shapes as a project progresses, thus, it is capable of adapting to the different stages of a project. Figure 4-19 shows these payments and their location during a project's life cycle. Each type of owner payments and how it is processed by owners and contractors, from the respondents' perspective, is described in following points:

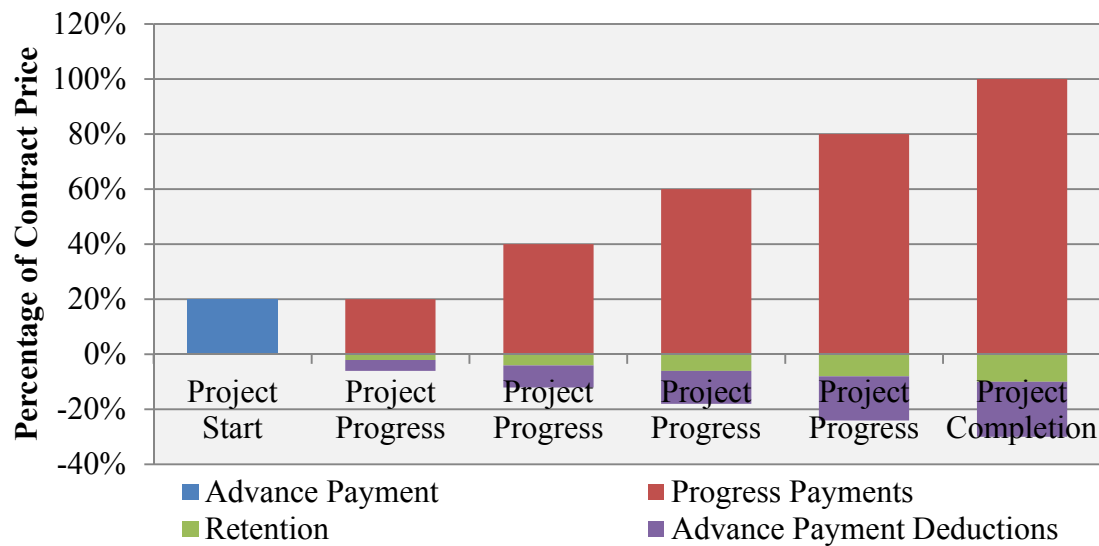


Figure 4-19: Owner's Payments' Locations and Values over the Project Duration

4.2.2.1 Advance Payment

In some construction contracts, a term of advance payment is agreed. The purpose of this payment is to support the contractor financially in the beginning of the project. This financial aid allows the contractors to pay for their mobilization costs and execute the setting up works (Halpin & Senior, 2009).

The results indicated that 88% of the participating contractors reported that they receive advance payments from owners of their projects. However, not all of the annual secured contracts have this payment option as it was demonstrated by the results. Actually, about 41% of the participating contractors reported that they receive advance payments in a range between 10% to less than 15% of their annual secured contracts. The same proportion of the participating contractors reported that they receive advance payments in more than 25% of their annual secured contracts. This variance in the results

can be explained by the fact that advance payment is agreed on the basis of the type and the size of the project, thus, not all of the executed projects by contractors need this type of payments in the beginning of the project. Sometimes, as the contractor has the ability to finance the project easily at that stage.

The results indicated that 50% of the participating contractors who receive advance payments reported that the average amount of the advance payments they receive is between 5% and 15% of the contract price. Almost all of the remaining participating contractors who receive advance payments (46%) reported that the amount of this type of payments is between 15% and 25% of the contract price. When asked if they were content with the amount of advanced payment received, the results indicated that about 64% of the participated contractors reported that they find the amount of the advance payments is not sufficient for them to fulfill their financial requirements at the beginning of the project. Regularly, the advance payment is utilized by the contractors to pay for their mobilization costs. However, the contractors may utilize the advance payment to pay advance payments to their subcontractors or the suppliers recruited in a particular project (Ross & Williams, 2013). This can explain the contractors need for increasing the amount of advance payments they receive from the projects' owners.

It was indicated by the results that the majority (64%) of the contractors stated that they repay the advance payment by installing it as percentages deducted from each progress payment. On the other hand, 32% of the participating contractors reported that they repay the advance payment by defining a fixed amount to be deducted from each progress payment they receive from the owner.

None of the participating contractors reported that they repay the advance payment after completing a project, i.e. by deducting it from the final payment. It seems that this method is not or is rarely used in Saudi Arabia.

Actually, the previous advance payment repaying methods were found to be very effective for contractors and owners. It is understood that once the purpose of the advance payment is achieved, i.e. setting up the project start, the owners will request their money back. Nonetheless, the owners cannot be repaid in one time; otherwise, the main function of the advance payment, i.e. to minimize the cash overdraft, will be revoked (Al-Dulaijan, 1987). Accordingly, we can say that following the aforesaid methods of repaying advance payments assures both contractors and owners the maximum effectiveness of the implementation of advance payment.

As the advance payment is paid before starting any activity in the project, the owner will ask the contractor to guarantee that the provided cash will spent on setting up the project activities. Accordingly, the contractor must apply for a letter of guarantee from the bank called 'advance payment bond' (Al-Dulaijan, 1987). The technique of applying this bond was discussed in the literature review.

4.2.2.2 Progress Payments

Corresponding to the continuous work nature that characterizes construction projects, the payments against the executed work is also usually paid periodically.

The results indicated that the majority (76%) of the participating contractors reported that they are paid progress payments every one month of the project duration. On the other hand, about 16% of the participating contractors stated that they are paid progress payments after completion of certain work as agreed in the contract. The remaining 8% of the participating contractors showed that the owners pay them progress payments at designated milestones of the project. Actually, the previous findings significantly match the discussion in the literature. Respecting the agreed conditions in the contract between the contractor and the owner, a contractor bills his work for the previous agreed period, usually one month, and submits it to the owner. Accordingly, the owner revises the invoiced work and pays the invoice, once it is certified (Al-Dulaijan, 1987).

The results also indicated that the participating contractors reported that they are somewhat satisfied with the timing of owners' progress payments. Almost 52% stated that they receive payments on time, while the other 48% showed that the owners delay their payments beyond their due dates. Figure 4-20 presents the amount of delay in owners' progress payments as reported by the 48% of the participating contractors who face payment delay problems with the projects' owners. In fact, the timing of being paid is very important to the contractor. As was mentioned previously, the contractors concern is to minimize the financial gap between their cash outflows and inflows. This is mainly obtained by getting contractor expenses as close as possible to owner payments (Al-Dulaijan, 1987).

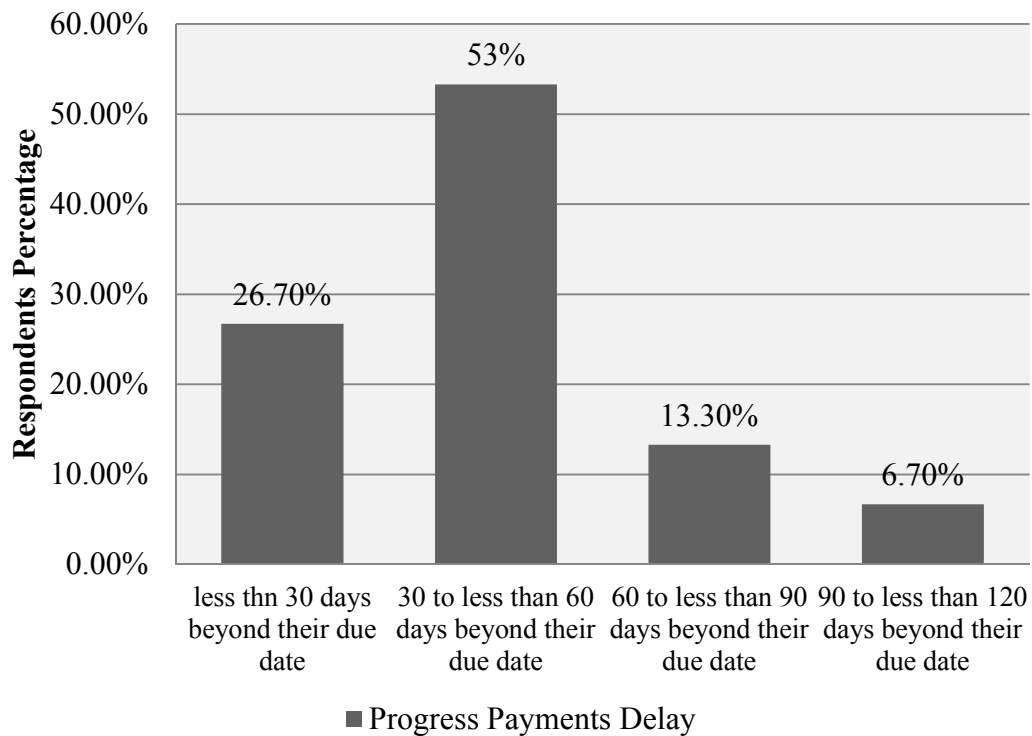


Figure 4-20: Progress Payments Delay

Actually, delaying payments is a common practice between the different parties involved in the construction process and is therefore not a phenomenon that solely associated with the projects' owners. General contractors, as well, practice the same with subcontractors and suppliers (Ross & Williams, 2013). Consequently, to avoid the corresponding problems with payments delay, the contractors should take this delay into account. Hence, the contractor, while forecasting his cash flow, should locate the due date of receiving the cash against a certain work at a point in the future, giving the owner reasonable period for revising the billed work (breathing space). This period is usually clarified in the contracts. Moreover, the contractor according to owners' history can assume another amount of payment delay, for example between 30 and 60 days, as stated by the majority of respondents. By summing these two values of delay, the contractor can

enhance the effectiveness of his cash flow forecasting and avoid many problems (Ross & Williams, 2013).

Delaying progress payments by projects' owners have a considerable effect on the whole progress of the project activities. Owners may raise excuses such as, "the payment is under process", "we have encountered problems in issuing the check" and "work should be re-measured", etc.

The results indicated that the participating contractors reported that there are many reasons behind payments delay. The approval process for the invoiced work was considered a significant factor of delaying the payments by the owners as the majority (65%) of the participating contractors demonstrated. It seems that the process of approving the contractor invoice passes through many personnel to get certified. The number of approvals for the contractor invoice may reach 15 approvals in some projects, which may take a period of more than 10 days; still, this period can reach more than 100 days in some projects (Al-Dulaijan, 1987).

Furthermore, 25% of the participating contractors reported that the concept of bureaucracy, which may exist in some organizations, is another significant factor that may cause owners' payments delay.

The results also indicated that the about 5% of the participating contractors reported that they find other factors, like disputes and budget shortage, can be the reasons behind the owners payments delay.

It was also declared by the contractors that corruption that may take place inside the owners' organizations is one of the significant reasons of owners' payments delay.

However, due to the sensitivity of this issue, contractors declared this issue verbally, and avoided mentioning it in their answers. The reasons of owners' payments delay and their share of respondents' votes is presented in Figure 4-21.

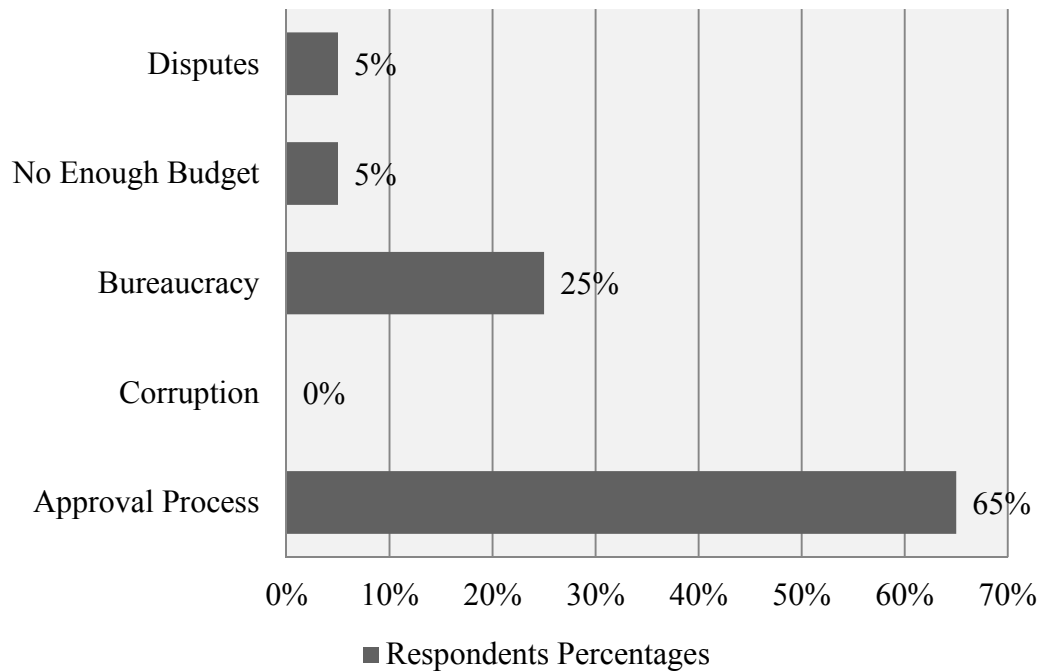


Figure 4-21: Reasons of Owners' Payments Delay

Contractors still need to manage these delays in their own way to keep their projects financially safe, even by means of constructing a well-forecasted cash flow prior to a project's beginning, or by facing the delay at the time it happens. Contractors showed more than one behavior in the case of owner's payments delay as shown in Table 4-2.

The results indicated that most of the participating contractors continue work despite progress payments delay from owners. Contractors are found to use different strategies whenever the owners delay progress payments. The most popular action was found to be that the contractors continue work by borrowing money from other ongoing

projects' accounts. It seems that some contractors don't realize the damages they incur whenever they use this strategy. Although this strategy may solve the problem, the cash flow of other projects will be disturbed.

Table 4-2: Actions towards Owners' Payments Delay

S/N	Action	Percentages of Respondents
1	Continue work and delay payments to labor, management, and suppliers.	13.3%
2	Continue work by borrowing money from a bank with intention to claim the interest from the owner.	20%
3	Continue work by borrowing money from another ongoing project account.	40%
4	Continue work by borrowing money from our organization's available cash with intention to claim an interest from the owner.	33.3%
5	Stop the work until payments are made.	26.7%
6	Lower the rate of work and strongly follow up the payment.	6.7%

Actually, contractors may have other practices to deal with such delay from the owner's side. The results indicated that along with the previous mentioned action towards owner's payments delay, the contractors showed other alternative actions that they may consider depending on the situation that they encounter.

About 33% and 20% of the participating contractors, respectively, reported that they may borrow money from the owned cash by their organization or from a bank. In fact, to take such an action without a well forecasted plan may affect the financial status of the contractor and the project's success as well. Even if the contractors raised a claim that they should be compensated for the corresponding cost of the borrowed money, they will encounter the risk of accepting or rejecting their claim.

Another action adopted by some contractors in case of owners' payments delay is to stop the work until the owner pay the delayed due payment. Although this action may protect the contractor from a real financial failure, it may cause an uncomfortable relation with the owner.

To avoid such a negative relation with the owners, some contractors (6.7%) stated that they lower the rate of their work to send an alarm to the project's owner making them realize that delaying the payment is beginning to have an impact on the work. This action seems to be a relatively effective strategy to prevent financial problems and maintain a good relation with projects' owners.

4.2.2.3 Retention

A common practice among projects' owners is to retain a percentage of every progress payment as an insurance against contractors' failure. The owners apply the retention term in their contracts to guarantee that the contractor will fulfill the substantial obligations against his contract (Halpin & Senior, 2009).

The results pointed out that 84% of the participating contractors stated that they practice retention provision in their contracts. The results also showed that the majority (68%) of those contractors reported that the amount of the applied retention in their contracts usually ranges between 5% and 10% of the contract price, while about 23% reported that it ranges between 10% and 15% of the contract price. Still, there is retention provisions applied with that is less than or equal to 5% of the contract price. These results highly match what was discussed in the literature review. It was stated that the retained amount of the progress invoices usually ranges between 5% to 10% of the invoiced amount and the project value as well (Halpin & Senior, 2009).

An important corresponding statement to applying retention in any contract is to define the procedure and requirements that the contractor need to satisfy in order to release the retained money. Generally, the contracts require a substantial completion of the project by the contractor in order to release the retained sum of money (Halpin & Senior, 2009).

The participating contractors reported some requirements that might be specified by the owner before releasing the amount of retention (See Figure 4-22).

Reviewing Figure 4-22, we can conclude that the results indicated that the majority (about 73%) of the participating contractors reported that the owner will release the retention once they handed over the project and submitted the guarantees letters for the facility's machines and equipment. Zakat certificate, which is mainly a governmental requirement document, also was selected by 50% of the participating contractors to be one of the required documents for releasing retention amount.

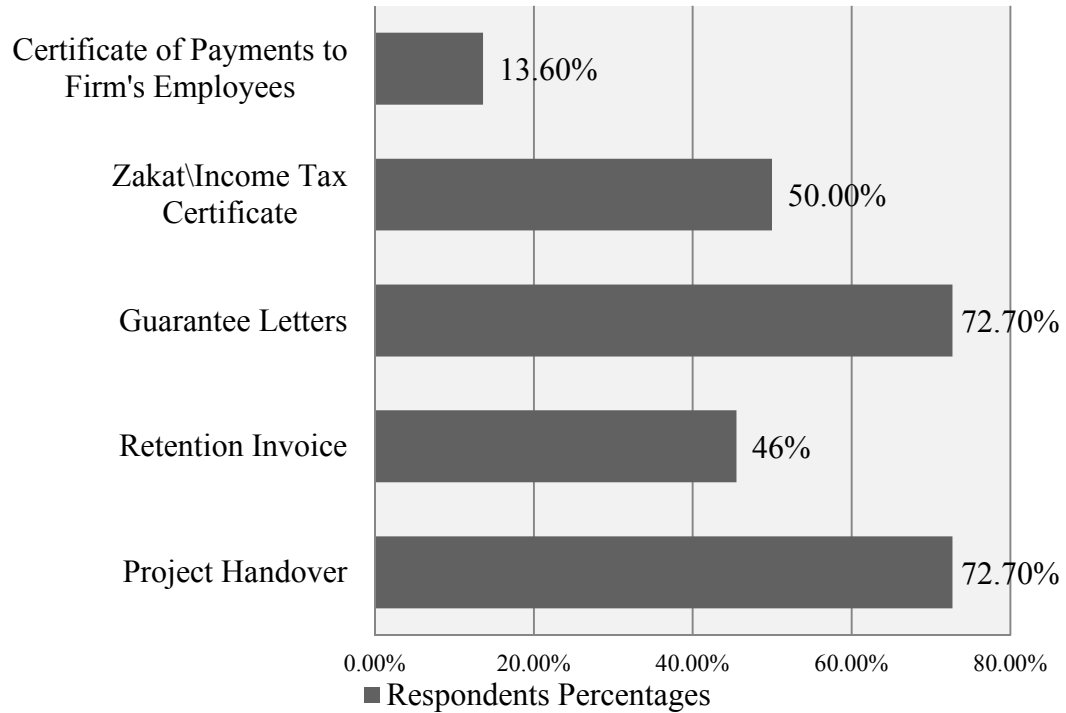


Figure 4-22: Releasing Retention Requirements

Explaining the importance of providing these requirements, it is believed that the main function of the retention is to guarantee the owner that the contractor will fulfill the requirements of the project. Once a contractor shows this to an owner, an owner will accordingly release the retained amount money.

However a gap of time was noticed between receiving an owner's approval for the aforementioned requirements and the time that a contractor requests his retained money. Fortunately, this period doesn't take too long. The majority (59%) of the participating contractors stated that it is usually doesn't exceed 30 days. This indicates that the majority of owners release retentions within an acceptable time frame. Yet, there are results that indicated that about 14% of the participating contractors experience a

delay in receiving their retention payments by as much as 60 days. Still, this period may extend to more than 90 days as per about 18% of the participating contractors. Actually, this variance in the time gap before the contractor is allowed to request his retention amount can be due to the different conditions of contracts' clauses for the different projects. Moreover, sometimes, the existence of a good relation between the contractor and the owner may loosen the strictness in such cases, as the contractor may provide the owner more space to close the project financially.

It should be noticed that the retention has a considerable effect on the project cash flow. This why the contractors dislike the retention. The small overdraft, which is the key to an effective financial model, will be getting higher once the retention is there (Halpin & Senior, 2009). Accordingly, the time of releasing the retention is very important to contractors.

The owners, as reported by the participating contractors, display an ambivalent behavior with respect to the timing of paying the retention. About 32% of the participating contractors reported that the owners pay them the retention amount in a period between 10 days and 30 days from the date a request of the retained money is made, while about 36% stated that this period may take between 30 and 60 days. However, the owners may delay the retention payment beyond 90 days from the day of requesting it as was indicated by about 14% of the participating contractors. This clear variance in the amounts of retention payment delay can be explained by the fact that the owners, unlike with progress payment, don't know exactly when they need to release the retained amount for contractors, because this depends on when the contractor will hand over the project. Thus, the owners usually prepare this payment within a short period.

In fact, retention can be avoided by applying a retention bond. This financial facility enables the contractors to receive deduction-free progress payments. Correspondingly, the contractor will pay charges in the form of interests paid to the bank against acquiring the retention bond (Al-Dulaijan, 1987). The application method of this bond has been discussed in the literature review. Actually, this technique is not commonly applied by contractors in Saudi Arabia, instead they prefer to keep their money with the owner rather than conduct a business with banks. This is apparent when it is known that retention bond is one of the least applied banking facilities by contractors in Saudi Arabia. We can notice here that contractors always try to keep themselves away from banks, whenever they can.

4.2.2.4 Final Payment

Generally, construction projects are handed over in two stages, initial and final acceptance. Actually the period between these two stages allows the owner to get his facility occupied and give him the right to claim against any deficiencies that result from the poor execution of the contractor. The contractor in this period is responsible for repairing any deficiencies in the constructed facility, either due to bad workmanship or executing the work without respecting the contracts and specifications. However, contractors are still allowed to receive the final amount of the contract after the initial acceptance of the project and receiving the certificate of substantial completion (Al-Dulaijan, 1987).

The results indicated that the majority (75%) of the participating contractors usually submit the final payment invoice within 30 days beyond receiving certificate of completion, while almost 20% of them said that this period may extend up to 60 days after receiving the completion certificate. Again this period usually depends on the contract clauses between the owner and the contractor.

The results also indicated that the owners have unsteady behavior in paying the final payment invoice. It was reported by 32% of the participating contractors that the owners pay them the final payment invoice 10 to 30 days after invoicing, while 34% reported that this period usually ranges between 30 to 60 days. This period also may reach 90 days as reported by 24% of the participating contractors.

Regarding the requirements which need to be obtained by the contractors in order to allow them to receive the final payment, the results indicated that the majority of the participating contractors find that the project hand over and the guarantees letters are the most common requirements. However, other requirements like the Zakat Certificate usually required in the governmental projects. Figure 4-23 represents these requirements and the percentage of the participating contractors who find these that requirements are usually asked by project owners in order to release final payment. Actually, these results match what was discussed by Al-Dulaijan (1987) when he reported that the final payment is critical to both owners and contractors, as it is the last financial bond between them. The projects' owners used to request the contractors to submit certain documents, so that the contractors may ensure that they fulfill all their obligations towards the various parties involved in a project. In this way, the owners can manage their facility free of any outstanding problems that may take place after the end of the construction period.

Owners usually request the contractors to submit the zakat/income tax certificate, GOSI (General Organization Social Insurance) Certificate, and a certificate from labor and work office that verifies that the contractor compensated all of his employees and subcontractors in some cases.

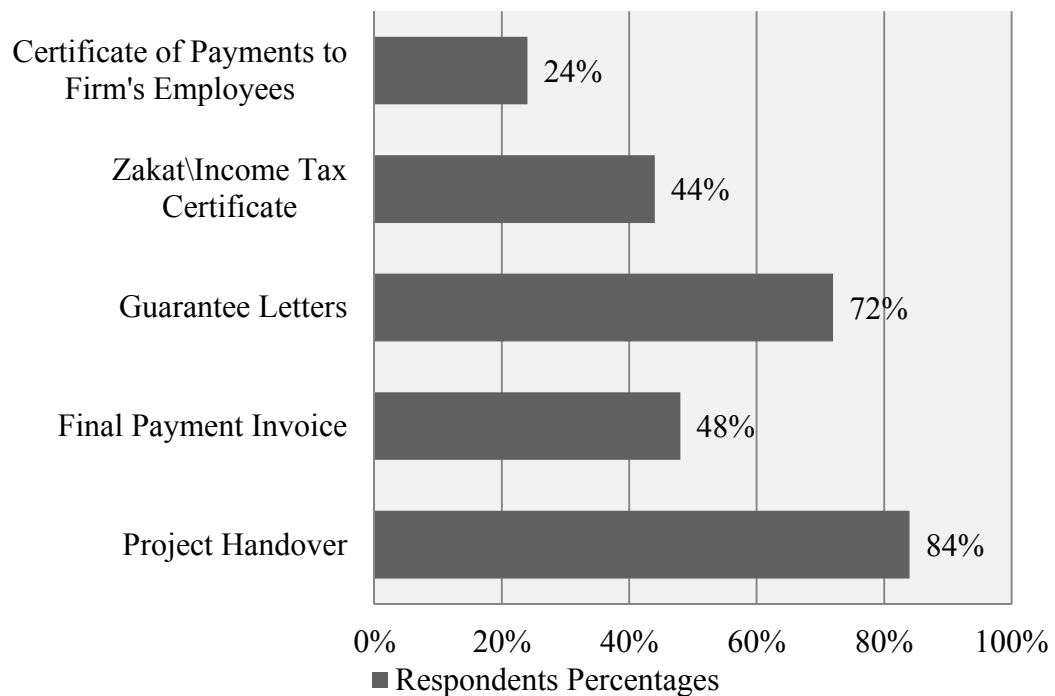


Figure 4-23: Releasing Final Payment Requirements

4.2.3 Cash Flow Analysis

From the above described financial components, the importance of conducting cash flow analysis for any project undertaken by the contractor is clear. The timing and amounts of these financial components strongly control the flow of the cash during the

project. This only can be determined by analyzing and forecasting the cash flow of the project (Ross & Williams, 2013).

The results indicated that the majority (76%) of the participating contractors stated that they do cash flow analysis or forecasting prior to bidding a project, while 24% of them reported that they do not. Although it is a positive indication, the main concern here is to know if these cash flow forecasting models are valuable enough to give a precise view about the projects' financial transactions.

Actually, Ross & Williams (2013) reported that contractors come across poor practices regarding the subject of cash flow analysis and forecast. Contractors usually don't conduct cash flow forecasting in the pre-bidding stage. Unfortunately, even if the contractors conducted cash flow forecasting, they don't consider the uncertainties that the project may pass through, thus, these forecasting models will not reflect the real status of the project once it is under construction. The main reason behind this poor implementation of the cash flow analysis and forecasting by the contractors is that the contractors usually have no time and budget in the pre-bidding stages to conduct these types of studies. Actually, many simple models don't take into account many factors that may affect the cash flow of the project; hence, it is very important to know that the level of database employed to analyze the cash flow is a very significant factor in determining the effectiveness of the modeled cash flow forecasts.

The results demonstrated that the main purpose behind conducting cash flow forecasting as reported by 85% of the participating contractors is to set cash flow baseline for control purposes.

Moreover, 70% of the participating contractors reported that they conduct cash flow forecasting or analysis for the purpose of determining the method that they will follow while financing their projects.

Another purpose of implementing cash flow analysis as reported by 60% of the participating contractors is to determine the cost of financing the project, so they can include it in the bidding price. Actually, only 45% of the participating contractors reported that they forecast the cash flow to determine the amount of overdraft. As was mentioned previously, calculating the overdraft amount plays a vital role in determining the suitable financing method. But, as the results indicated that a relatively low percentage of contractors conduct cash flow forecasting for this purpose, we may state that the contractors conduct simple cash flow models which are incapable even determining the amount of overdraft to use in the decision of choosing the suitable financial technique. This may indicate that poor financial practices are applied by some contractors in Saudi Arabia.

Contractors, as can be observed from the results, try to perform their cash flow forecasts to fit their needs. In other words, the level of accuracy of the cash flow may differ from one project to another according to the contractor needs. Figure 4-24 represents the contractors' purposes for conducting cash flow analysis or forecasting.

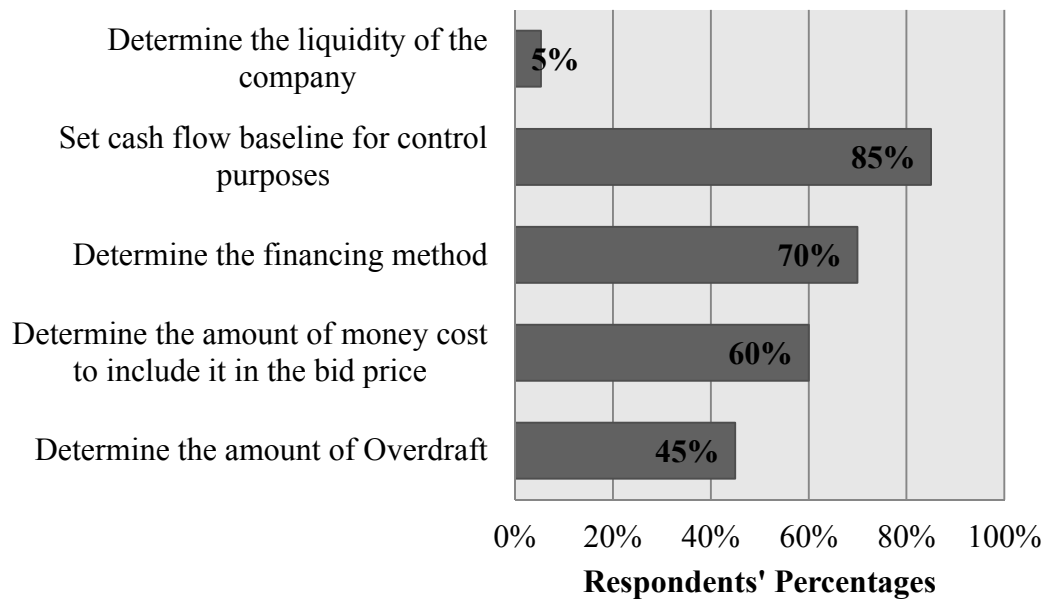


Figure 4-24: Purposes of Cash Flow Forecasting

The results indicated that the majority (60%) of the participating contractors do not encounter contracts' failure due to poor cash flow management. However, 15% of the contractors were subjected to financial failure for 5% to 15% of their annual contracts, while 10% of them stated that less than 5% of their annual contracts fail due to poor cash flow management as shown in Figure 4-25. Actually, it is expected, with such reported reactions toward payments' delay, that some contractors have some failing contracts.

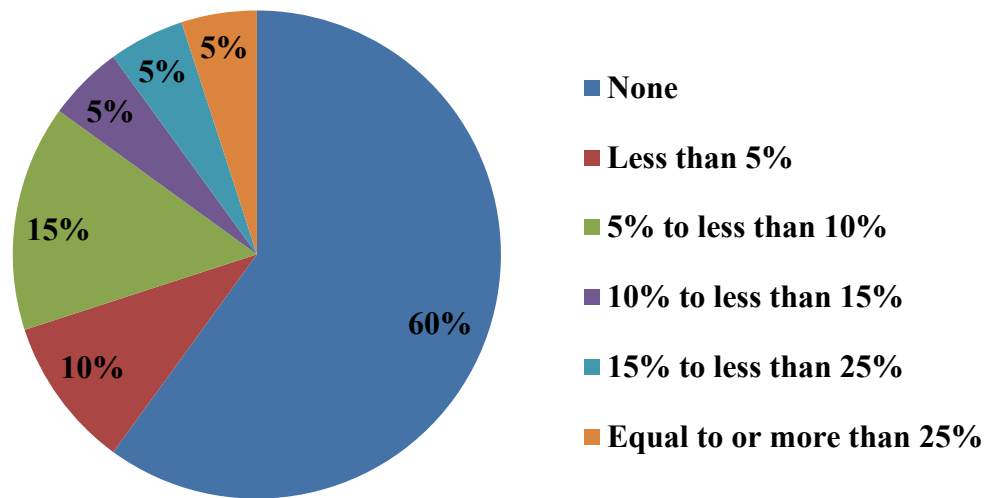


Figure 4-25: Percentages of Contracts Fail Annually Because of Poor Cash Flow Management

4.3 Financing Techniques

To finance a construction project doesn't mean to pay for its expenses using owners' payments only. Actually, the uncertainty and risk involvement, which are the main characteristics of the construction industry, force the contractors to invariably experience financial gap along their projects' lifecycles. This financial gap, or working capital as it is known is the amount that needs to be financed by the contractors. As it was discussed in the literature review, the working capital which is estimated after performing cash flow analysis and forecasting for the project should be well determined as it will be the source of evaluating how much 'liquid cash' the contractors need in order to operate their project sufficiently (Ross & Williams, 2013).

The contractors have mainly two options at their disposal to generate cash to unloose the capital lookup (the amount of work done by contractor and yet not paid by the owner). Contractors either pay from their own cash (equity financing), or they need to get a lender to facilitate them with cash (debt financing) (Ross & Williams, 2013).

To reflect the real picture in the construction industry market in Saudi Arabia, the contractors were asked about the portions of each of these financing techniques they apply. The respondents showed that, on average, 56% of their financing applications are Self-Financing, while they turn to get banks' aids in 44% of the cases as shown in Figure 4-26.

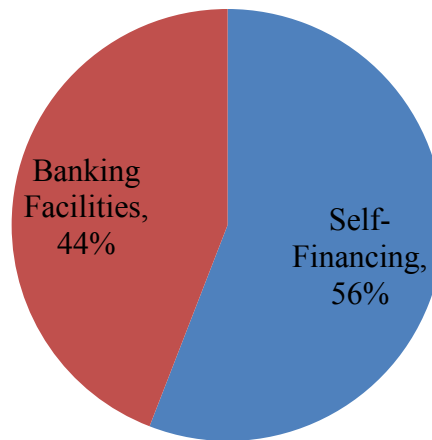


Figure 4-26: Average Percentages of the Applied Financial Techniques

Actually, this distribution of self-financing and debt financing has low level of accuracy as Figure 4-27 shows, that the participating contractors' answers have high variances, i.e. they are relatively far from the reported average values. It is believed that the self-financing techniques had this relatively high percentage because there was a considerable number of contracting firms that run other types of businesses besides being contractors, real estate investment, for example. A second source of revenue enhances

this type of financing. Another explanation of this observation is that the small firms may have limited chances to secure a loan deal with banks, while large contractors are the best banks' clients (Ross & Williams, 2013).

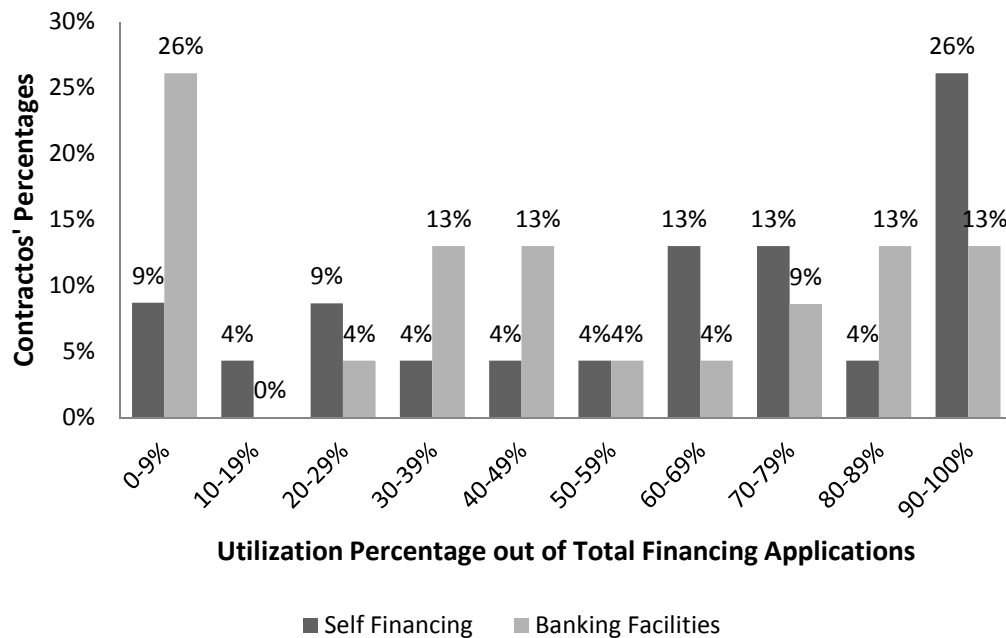


Figure 4-27: Contractors' Utilization Percentages of Self-Financing Vs. Banking Facilities

Moreover, this high variance in the aforementioned results may indicate that the contractors may have some difficulties with financial institutions, i.e. banks. This will be determined in the coming sections. Going into details, the different types of financing and the contractors' tendency to apply these techniques are described below:

4.3.1 Self-Financing Techniques

Using these types of financing techniques enables contractors to be free of being tied by banks' facilities. However, these techniques have their own disadvantages.

Mainly, the internal sources of finance are Equity and Shareholders Investment. Although the trade credit financing seems to be an external financing technique, it was considered to be one of self-financing techniques as the banks aids are absent in this technique. The types of self-financing applications and their percentages of utilization are presented in Table 4-3 and described below:

Table 4-3: Utilization of Self-Financing Techniques

Self-Financing Techniques	% of Implementation	Standard Deviation
Retained Profit	39%	29.5
Equity	34%	30.5
Trade Credit	27%	23.3
Total	100%	-

1- Retained Profit

The participating contractors stated that this technique constitutes 39% of the self-financing techniques. This percentage is considered relatively high, thus, this type of financing is a good source of working capital, especially, in the absence of banks' loans.

Ross & Williams (2013) stated that for some cases in which the retained profit is considered relatively high it can be utilized as a working capital to operate the firm's ongoing projects.

2- Equity

Also referred to as risk capital, is the invested capital by the shareholders\owners in the firm. Usually, the implementation of this type of financing is essential as it fits the company needs most of the time and requires no guarantees toward external parties.

However, the risk that is prevented by avoiding the banks' facilities in this technique is borne by the shareholders as the repayment of their investment is not assured. This type of financing is commonly used by firms that are considered to be new to the market. Those contractors, as was mentioned previously, have inadequate access to banks' facilities, therefore, their best choice is to apply equity financing (Ross & Williams, 2013).

The participating contractors reported that this type of self-financing techniques forms about 34% of the various self-financing techniques. Although, equity financing is known to have a significant share of risk, respondents classed its risk to be a medium risk involvement. This may explain the prevalent use of this technique by contractors.

3- Trade Credit

The results indicated that the participating contractors expressed that this technique is reasonably applied when they gave it 27% utilization of self-financing techniques.

This technique as reported by many researchers is commonly used in the construction industry market, and it is applied by different parties involved in the project. This type of financing is applicable by firms of diverse sizes. Usually, contractors go to this choice when an expected payment is delayed or received with lower amount than it should (Ross & Williams, 2013).

4.3.2 Banking Facilities Financing Techniques

Once a bank committee approves a contractor's request for a banking facility (this will be discussed later), the contractor has the right to obtain a banking facility (Halpin &

Senior, 2009). This type of financing is constructed through an agreement between a contractor and a financial institution (Bank). This agreement states that the bank will liquidate the contractor with a specific amount of capital. The contractor, in turn, will provide guarantees that he will repay the lent money with an extra amount of interest (Ross & Williams, 2013). Generally, the types of banking facilities can range from short-term to long-term finance (Ross & Williams, 2013). Usually, the short-term finance is used to fund the changes in the predicted amount of the working capital of the project, while the long-term finance is applied to finance the general operations of the company. Banking facilities types and how contractors imply them are shown in Table 4-4 discussed below:

Table 4-4: Utilization of Banking Facilities Techniques

Banking Facilities	% of Implementation	Standard Deviation
Short Term Loans	11%	18.3
Term Loans	24.4%	33.9
Long Term Loans	5.8%	13.8
Overdraft Accounts	4.3%	5.9
Invoice Financing	17.5%	19.8
Bid Bonds	4.5%	6.2
Advance Payment Bonds	6.9%	7.0
Performance Bonds	5.2%	5.3
Retention Bonds	4.3%	5.2
Letters of Credit	12.4%	13.3
Hire Purchase\Leasing	3.7%	7.5
Total\ Average	100%	

1- Loans

Loans are the typical form of banking facilities. These loans can be short-term loans, term loans or long-term loans. A contractor asks for a specific amount of money from a bank and he guarantees that he repays it with an interest rate after an agreed period.

The results indicated that the participating contractors reported that they apply bank loans with a percentage of 41% of the total usage of banking facilities. Long-term and medium-term loans comprise 73% of the total utilization of banks' loans, while short term loans forms only about 27% of them. This indicates that the contractors mainly apply this type of finance in order to operate long term activities (for more than 1 year).

2- Overdraft Accounts

The participating contractors reported that they utilize this type of financing with an average percentage of 4.3% of the different banking facilities.

Actually this gives an indication that the contractors understand the risk associated with applying this financing technique. The participating contractors showed different behaviors with regards to applying this financing method than the common ineffective behavior of contractors. It was reported by researchers that the proper method of applying this financing technique is to deal with it as a temporary financing facility. Anyway, this is not what happens in the real world. Contractors apply overdraft accounts with an improper utilization. Banks can call-in overdraft at any time; this is why the contractors should schedule paying back the overdraft within a short period (Ross & Williams, 2013).

3- Invoice Financing

The participating contractors find this technique good to fulfill their long term financial needs. The results indicated that they gave it a share of about 17.6% of the implementation of banking facilities financing.

As it was reported by many researchers, this acceptance of applying this financing method is expected as the probability of owners' payment delay is relatively high, thus, the contractors are willing to find an exit in such cases. Invoice financing is a good solution in this case, as the contractors concern here is just to receive the amount of cash estimated by their cash flow analysis in the pre-construction phase, therefore, they are able to keep themselves liquidated by cash as the project progresses (Al-Dulaijan, 1987).

4- Bonds

The participating contractors stated that the implementation of bonds financing is just about 21% of their usage of banking facilities.

As it was discussed previously, bonds are applied mainly to protect the owners from the contractors' financial failure, hence, the contractors sometimes have no option but to ask the banks for one or more of the different bond types: Bid Bond, Advance Payment Bond, Performance Bond, and Retention Bond.

5- Letters of Credit

As it was indicated by the results, the utilization of this type of banking facilities forms 12% of their total implemented banking facilities.

It was identified that the materials cost at any project is significantly high compared with other types of costs. Therefore, contractors may not find the sufficient

cash to purchase these materials at the needed time. To avoid delaying the project because of the failure of delivering the materials at the needed time, the banks offer LC financing. This type of financing gives the contractors the ability to mainly purchase materials and equipment as these items necessitate a relatively high amount of cash.

4.3.3 Comprehensive Description of Financing Techniques Implementation

Analyzing the respondents' answers showed that the contractors try to keep themselves equally supported by the different financing techniques. Although it has been discussed that the risky financing techniques are the ones provided by the company itself, the respondents stated that they find them safe enough to be utilized effectively. In fact, this can be realized as the construction industry in Saudi Arabia is considered to be a trustable and profitable business sector. Shareholders\owners can invest their money feeling comfortable that their money will be repaid. Also, the complex relation between contractors and banks in which the primary concern is risk allocation, keeps the contractors cautious when it comes to applying for a banking facility.

The participating contractors reported that they find it highly applicable to implement the various types of self-financing techniques. They ranked them in a relatively high level of suitability, finance effectiveness, finance cost and risk involvement as shown in Table 4-5.

Table 4-5: Evaluation of Self-Financing Techniques

Self-Financing Techniques	Suitability Scale (1 to 5)	Standard Deviation	Finance Effectiveness Scale (1 to 5)	Standard Deviation	Finance Cost Scale (1 to 5)	Standard Deviation	Risk Involvement Scale (1 to 5)	Standard Deviation
Retained Profit	High	1.2	High	1.4	High	1.3	Med.	1.6
Equity	High	1.1	Med.	1.2	Med.	1.1	Med.	1.5
Trade Credit	High	1	High	1.4	High	1.4	Med.	1.4
Average	High		High		High		Medium	

On the other hand, the results indicated that the external financing techniques have various evaluations by contractors. The participating contractors reported that the banks' loans are reasonably applicable for them; they are the most applied techniques by the contractors (about 41% of the implementation of the banking facilities). Actually, it seems that the flexibility of loans applications and the variety of their amounts and associated costs give the contractors a convenient environment with regard to financing facilities applications. All loans types were ranked with a medium level from the different described perspectives.

The contractors stated that overdraft accounts are moderately suitable to be applied in their business, but, as was mentioned previously, the corresponding risk with this finance facility (the bank may call it in at any time), forces the contractors to minimize its implementation. The participating contractors implement overdraft accounts with 4.3% from the total implementation of banking facilities. A question might be raised that

if the contractors find this financing facility has a low cost and reasonable corresponding risk, then why do they limit their utilization of it? Actually, this contradiction can be explained by recalling what was mentioned in the literature review. Ross & Williams (2013) stated that, unlike the contractors' responses, overdraft accounts encounter a high amount of risk, because once the overdraft is called-in in the wrong time, the contractors will be under the danger of insolvency. It seems that the contractors limit their implementation of this financing type to the limit in which it works effectively with reasonable amount of cost and risk.

The invoice financing, unlike overdraft accounts, is one of the most applied techniques by the contractors (about 17.5% of the total implementation of banking facilities). Though they involve a high amount of interest and risk, the respondents showed that it is highly suitable and effective for them to apply invoice financing technique. This may indicate that long term project activities (e.g. subcontracted work) force the contractors to get a financial aid, even if this will incur a high amount of cost and risk. This was confirmed by the participating banks as they ranked this technique as a highly utilized technique by contractors.

Bonds, which have a significant share of banking facilities implementation (21%), were equitably accepted by respondents from the perspective of suitability, effectiveness and cost. However, respondents agreed that the involved risk by applying for any type of bonds is between medium and low risk. Generally, as it was discussed before, in many cases, the contractors have no choice but to purchase a bank bond. In order to keep projects' owners secured, many contracts deal strictly with providing the contractor bonds against owner payments.

In fact, it is clear from the participating contractors' answers that the relation between having an effective banking facility and the associated cost and risk with it is directly proportional. Simply, you need to pay more to get the best. Table 4-6 presents contractors' evaluation of the different banking facilities.

However, the contractors seem to be aware of the relation between a suitable banking facility and its corresponding cost and risk. They employ these financing facilities, distributing them judiciously over their needs. In other words, they try to reach the most optimized combination of the different financing techniques by paying the least and keeping themselves far away from the risky financing applications.

Table 4-6: Evaluation of Banking Facilities (Contractors' Perspective)

Banking Facilities	Suitability Scale (1 to 5)	Standard deviation	Finance Effectiveness Scale (1 to 5)	Standard deviation	Finance Cost Scale (1 to 5)	Standard deviation	Risk Involvement Scale (1 to 5)	Standard deviation
Short Term Loans	Med.	1.5	Med.	1.5	Med.	1.3	Med.	1.1
Term Loans	Med.	1.4	Med.	1.2	Med.	1.0	Med.	1.0
Long Term Loans	Med.	1.7	Med.	1.5	Med.	1.6	Med.	1.4
Overdraft Accounts	Med.	1.2	Med.	1.3	Low	1.4	Med.	1.2
Invoice Financing	High	1.0	High	1.3	High	0.9	High	1.6
Bid Bonds	Med.	1.2	Med.	1.5	Med.	1.5	Med.	1.5
Advance Payment Bonds	High	1.2	High	1.0	High	1.0	Med.	1.5
Performance Bonds	Med.	1.5	Med.	1.2	Med.	1.4	Low	1.4

Banking Facilities	Suitability Scale (1 to 5)	Standard deviation	Finance Effectiveness Scale (1 to 5)	Standard deviation	Finance Cost Scale (1 to 5)	Standard deviation	Risk Involvement Scale (1 to 5)	Standard deviation
Retention Bonds	Med.	1.4	Med.	1.3	Med.	1.2	Med.	1.3
Letters of Credit	High	0.9	High	0.9	High	0.8	Med.	1.3
Hire Purchase\ Leasing	Med.	1.2	Med.	1.1	Med.	1.0	Med.	1.1
Average	Medium		Medium		Medium		Medium	

The participating banks, from their side, presented a consistent description with the contractors' description of the utilization of the different banking facilities. This observation indicates that the banks understand the needs of contractors. This is clear as all banks almost serve all of the previously mentioned banking facilities. The results indicated that the banks identified contractors' utilization of the different banking facilities with similar figures as those mentioned by the contractors. Moreover, they categorized the purposes of using these banking facilities by the contractors in the same way that the contractors did as shown in Table 4-7.

Table 4-7: Analysis of Banking Facilities (Banks' Perspective)

Banking Facilities	% of Banks which Offer The Facility	Contractors Utilization Scale (1-5)		Major Purpose of the Facility
		Mean	Standard Deviation	
Short Term Loans	100%	High (2)	1.4	Project Finance
Term Loans	100%	High (1.9)	1.0	Assets and Equipment Finance
Long Term Loans	86%	Medium (2.8)	1.6	Assets Finance
Overdraft Accounts	75%	High (2.1)	2.0	Project Finance
Invoice Financing	88%	High (2)	1.4	Project Finance
Bid Bonds	100%	Very High (1)	0.0	Project Finance
Advance Payment Bonds	100%	High (1.8)	1.2	Project Finance
Performance Bonds	100%	Very High (1.3)	0.5	Project Finance
Retention Bonds	57%	Medium (2.8)	1.8	Project Finance
Letters of Credit	100%	Very High (1.5)	0.8	Project, Assets and Equipment Finance
Hire Purchase\Leasing	57%	Low (3.3)	1.0	Project and Equipment Finance

4.4 Factors affecting Project Cash Flow

It is obvious from all of the above that if you want a successful financing model, you need to know how much cash you will receive, and when you will receive this cash. Actually, any inconspicuous answers for these two questions will affect the effectiveness

of the applied financial techniques by the contractor. Instead, to avoid poor financial technique, the contractors need to establish a well forecasted cash flow analysis, which considers the unforeseen conditions and the uncertainties such as payments delay, loose cash flow, poor finance personnel, and project delay that may drive their financial model to the failure.

The participating contractors, as indicated by the results, reported that payments delay has a very severe level of effect on their financial success. Specifying the delay of advance payment, the respondents also stated that it has a considerable level of effect when they ranked it as a severe problem. Actually, this is an expected evaluation as it was mentioned before that the thrust that the advance payment gives to the cash flow of the project at its commencement effectively reduces the contractors need for external financial sources. This finding supports the notion that one common practice in construction industry is to delay payments. Actually, it is close to being one of the regular behaviors of the different parties involved in the business. As our concern here is to study the contractors' perspective, we can tell that delaying the payments by the project owner is one of the persistent problems which face the contractors during the execution of their projects (Ross & Williams, 2013). In general, delaying the payments by the owner means substantial changes in the estimated cash flow of the project, thus, an unexpected scenario will take place which is usually difficult for the contractors to control, and, consequently, a series of unstudied actions will be conducted by the contractors to save themselves against failure. Consequently, the successive poor managed practices by the contractors will generate more problems. One example of these practices is to fund the affected project using the allocated fund from other projects. Actually, the participating

contractors found that this practice has a considerable level of effect on the project when they ranked it as a medium-severeness problem.

The participating contractors stated that loose cash flow management has a great effect on financial plans. They find the poor cash management in their organizations, and underestimating the needed fund for a project are problems that may moderately affect financing their project successfully. Ross & Williams (2013) stated that contractors will face a real source of danger if they fail in employing the best combination of cash flow management tools. Misunderstanding the type of the project, the contracts' documents, and misestimating the corresponding risk to the project execution process are examples of weak sides of the forecasted cash flow of the project.

Moreover, to have a well-managed financial decision, the contractor needs to have professional financial personnel. It is known that the construction industry cannot be managed based on a set of standards or pre-studied actions; actually, the uncertainties and the risk involved in the construction industry require experts in the field to drive their business successfully. Respondents considered poor financial personnel in their organizations as a significant factor that may affect the financial management operations in their organization; they ranked this as a problem with medium severeness level.

Another problem that the contractors may encounter when they finance a project is project delay which is caused either by the consultant or the owner. Although this delay is usually regulated by some clauses in the construction contract, the contractors still need to be aware of the actual project duration in order to accurately manage their cash flow and determine their financial need (Ross & Williams, 2013). Otherwise, this delay may

put a contractor in the danger of failure due to the unforeseen costs related to this delay and the limited fund that may be available at that time. Respondents considered the delay of the project by the client or the consultant one of the severe problems that may lead to their financial failure.

It is important to know that the effect of these problems doesn't cause temporary stumbles only. Actually, their effect may extend to cause organization bankruptcy. As it was described before, financial management is one of the vital keys to the overall company success, and once an organization fails to execute financial management with a high degree of efficiency, it can be at the ledge of bankruptcy, as what has happened one at least once with about 17% of the participating contractors.

4.5 Banks and Contractors Relationship

As it was discussed previously, the relation between banks and contractors is established in the purpose of borrowing money. Once a contractor has a financial gap which he needs to liquidate, he will look towards constructing an agreement with a bank in order to provide him a financing facility. Conversely, banks will ask for securities to assure safe agreements with their contractors clients (Crundwell, 2008).

4.5.1 Banks' Requirements for Financing Application

According to this type of relation between contractors and banks, it is understood that the main concern here is to bridge a trustable attitude between contractors and banks to assure the maximum benefits for both of these parties. In other words, the two parties here have two main goals behind establishing this relation: to satisfy their needs (loan for contractor and profit for bank) while keeping themselves as far as possible from the unforeseen risk that may result because of this business.

Actually, risk consideration is the main component in the framework that regulates the financing transactions between banks and contractors. Banks try to strictly establish adequately secured frameworks to keep themselves always in a proactive situation toward their relation with the contractors. Thus, the contractors need to build the trust with the banks by issuing the securities requested by the banks. Otherwise, the relation between banks and contractors will be in the danger of failure (Scannella, 2013).

Table 4-8 shows the different securities and requirements that might be asked by a bank in order to facilitate a contractor with financial aid. These securities and requirements were ranked by the participating contractors with the frequency level in which the banks ask for these securities. In the same time, the participating banks were asked to show the importance of these securities in terms of providing them to contractors. Reviewing the data represented in Table 4-8, we can see that the contractors are fully aware of banks' requirements.

Table 4-8: Banks' Securities' Frequency Level and Importance Level

S/N	Requirements\ Securities	Contractors' Ranking Scale (1-3)	Standard Deviation	Banks' Ranking Scale (1-5)	Standard Deviation
1	Contractor's profile	Required All Time	0.70	High Importance	1.41
2	Contractor's experience in the construction field	Required Sometimes	0.86	High Importance	1.01
3	Contractor's financial history	Required All Time	0.60	High Importance	1.00
4	Profiles of organization's owners	Required Sometimes	0.82	Medium Importance	1.24
5	Contractor's clients characteristics	Required Sometimes	0.66	High Importance	1.42
6	Financial statement of the organization	Required All Time	0.38	High Importance	1.58
7	Audition of the financial statement	Required All Time	0.49	Very High Importance	0.88
8	Accounts receivable	Required Sometimes	0.88	High Importance	1.09
9	Balance Sheet	Required All Time	0.77	High Importance	1.45
10	Income Statement	Required All Time	0.68	High Importance	1.45
11	List of ongoing contracts	Required Sometimes	0.81	High Importance	1.12
12	List of under bidding contracts	Required Sometimes	0.77	High Importance	1.12
13	List of completed contracts	Required Sometimes	0.77	High Importance	1.41
14	Assets for collateral (Lands, equipment, stocks, etc.)	Required Sometimes	0.69	High Importance	1.23
15	Personal guarantees	Required Sometimes	0.71	High Importance	1.45
16	Corporate letter of guarantees	Required Sometimes	0.51	High Importance	1.12

17	Billing terms and policies for the project	Required Sometimes	0.71	High Importance	1.23
18	Project time schedule	Required Sometimes	0.76	High Importance	0.87
19	Project type	Required Sometimes	0.68	High Importance	1.17
20	Contract value	Required All Time	0.60	High Importance	1.12
21	Cash flow projection	Required All Time	0.61	High Importance	1.41
22	Contract type\scope of work	Required Sometimes	0.67	High Importance	1.41
23	Clarity of scope of work	Required Sometimes	0.79	High Importance	1.36

It can be noticed that some requirements received high ranks from the banks, signifying high importance, while the contractors reported that these same requirements are sometimes required. Actually, this can be explained the fact that the main concern here is to convince the bank that the contractor is eligible to receive the requested banking facility. So, in the case that a contractor faces difficulty in meeting one or more of bank's requirements, he may still have the ability to arrive at a deal with the bank if is able to substantiate that he has a trustable financial ability to get the requested banking facility. Because of this flexibility in some cases, some contractors find themselves able to bypass some of the requirements that the banks find highly important.

4.5.2 Financing Application Approval\Rejection

Actually, providing the contractors the previous mentioned securities does not guarantee their access to the bank's financing facilities. The bank's framework structure still has other components before it can approve a banking facility for a contractor. It is believed that one of the main components in building trust between banks and contractors is the good reputation of a contractor. The history of the contractor, from a financial and work behavior perspective, has a great effect on the approval process for a bank loan. Banks strongly agreed with this statement as it is one of the major reasons for rejecting a contractor's loan request.

In addition, as it was stated before, one of the main reasons of the higher utilization percent of the equity financing than debt financing is the limited access of small contractors to the banks' financing gates. Actually, bankers said that they somewhat agree with considering this factor as one of the reasons that they may reject a loan application.

Still, the main concern for bankers is to have their money back; therefore, they may find a contractor not eligible to receive a debt financing facility in case they don't have the financial adequacy to pay back their loan. Bankers, also, moderately agreed with this statement, as they see that the applicants for a banking facility will be directly filtered by determining their ability to submit the previous mentioned securities and requirements.

Another possible reason for rejecting a financing application by a bank is the amount of cash that the contractors should secure in their accounts before applying for a banking facility. Actually, the participated bankers reported that they somewhat disagree with considering this as one of the reasons to reject a contractor's request for financing application. It seems like banks cannot depend on the available cash in a contractor's account to guarantee that the given money will be repaid, instead, the banks fulfill their securities considering a contractor's assets, a contractor's reputation in the market, and a contractor's history with banks in previous secured banking facilities. This is clear as the participating bankers reported that, unlike with contractors' available cash, they somewhat agree with the statement that says that they may reject a financing application for a contractor if they found his assets not sufficient to secure the borrowed loan.

Other reasons for rejecting a banking facility request that the bankers reported that they somewhat agree with are revoking a contractor for their permits, a contractor's history in claims against the bank, and a contractor's history in breaching the finance contract. Actually, this is can be explained by the fact that banks care too much about their relation with the applicant contractor. They try to limit their business to those contractors who have a good history, either in their own business or in their relation with the bank.

Other reasons for a bank to reject a contractor's request for a banking facility and the bankers' level of agreement with these reasons are represented in Table 4-9.

Table 4-9: Reasons for Rejecting a Banking Facility Request

S\N	Reasons for Rejecting a Banking Facility Request	Level of Agreement Scale (1-5)	Mean	Standard Deviation
1	The contractor has a bad history in payment	Strongly Agree	1.44	1.33
2	The contracting firm's owners have no good financial reput	Somewhat Agree	2	1.41
3	The contractor history in breaching finance contracts	Somewhat Agree	1.89	1.05
4	The contractor previous history in claims	Somewhat Agree	2.22	1.30
5	The contractor is new to the construction industry	Somewhat Agree	2	1.23
6	Revoking of any permits or license for contractor	Somewhat Agree	2	1.32
7	The contractor's size in term of his assets	Somewhat Agree	1.89	1.05
8	The contractor's available cash in his accounts	Somewhat Disagree	2.78	1.48
9	The contractor has a history of poor performance in executing his projects	Somewhat Agree	1.89	1.54
10	The project owner	Somewhat Disagree	3	1.58
11	The endorsement documents	Somewhat Disagree	3	1.41

4.5.3 Problems Encountered by Banks after the Approval of a Contractor's Application

Fortunately, it seems like there is a stable relation between the contractors and the banks in the Kingdom. Problems will take place as a matter of fact. However, these problems are expected in an environment such as the construction industry environment. The current implemented regulatory framework applied by banks as a mean of processing financial facility request is a solid one. The soundness of this system assures minimum risk involvement in the future for banks, as well as enhancing the evaluation process of the contractors to end up with the most eligible contractors to be under the custody of bank's trust and covenant.

The participated bankers reported that they disagree with all of the probable problems that they may encounter after they approve a contractor application for a financing facility as shown in Table 4-10.

The participated banks explained this finding by stating that the requirements and securities that a contractor submits before having the approval for his application assures he banks that the likelihood of facing these problems is very low. Moreover, banks support their decision in accepting\rejecting a contractor application by routinely selecting clients that have a good reputation in the market and a good history with the bank. Those types of carefully selected contractors assure low involved risk in the banks' business and minimum amount of problems as well.

Table 4-10: Problems that Banks Encounter When Financing Contractors

SN	Problems	Level of Agreement Scale (1-5)	Mean	Standard Deviation
1	Contractors delay payments beyond due dates	Somewhat Disagree	2.78	1.30
2	Contractors fail to fulfill their covenants of finance documentation	Somewhat Disagree	3.11	1.45
3	Changes in the ownership of a project prior an agreed upon date	Somewhat Disagree	3	1.80
4	Contractors subjected to a court judgment	Somewhat Disagree	3.11	1.76
5	Revoking of any permits or license for contractor	Disagree	3.56	1.51
6	The project is abandoned	Somewhat Disagree	3.22	1.48
7	Failure of any party in the project contract	Somewhat Disagree	3.11	1.62
8	Contractor's poor performance in executing his project	Somewhat Disagree	2.67	1.80

4.5.4 Problems Encountered by Contractors When They Apply for Banking Facilities

The results indicated that the major problem for a contractor while requesting a banking facility from a bank is the lengthy approval process for their applications. In addition, the banks lateness in responding to a contractor's application was also found to be one of the main difficulties faced by contractors when dealing with banks. Actually, this is expected as the timing for payments plays a key role in the success of a contractor's financial system.

Moreover, the participating contractors stated that the banks' requirements to get an access to finance applications are one of the main difficulties they face with banks. In fact, especially for new contractors in the market, these requirements are sometimes difficult to obtain.

The high finance interests, the limitations on financing facilities and the conditions of the financing facilities offered by a bank for contractors were found to be significant obstacles that contractors may encounter when they apply for a bank loan. In fact, this is expected that these factors increase the risk and costs corresponding to the contractor's application for a bank loan.

Contractors prefer to manage their money by themselves. Actually, this is a little difficult to be applied when it comes to a deal with a bank. Banks, as one of the practices that they apply to secure themselves against contractors' failure, keep an eye on where a contractor spends the borrowed money. This practice was found to be one of the major problems encountered by contractors when they apply for a loan request.

Some of the participated contractors stated that the bank's inability to provide the required loan, or part of it is one of the problems that they may face when applying for a banking facility. As mentioned previously, it is very important for contractors to have the amount of cash they need without any shortage, otherwise, their cash flow will be greatly affected.

Cash margins blocking, and the system applied by banks to rank their clients (contractors) seem to be not greatly affecting the relation between bank and contractors

as little portion of the participated contractors evaluate them as problems they may encounter when they apply for a banking facility.

In general, it seems that even if it is to some extent difficult to secure a banking facility (at least for some contractors) once a contractor attains a facility, the relation between him and the bank seems to be stable and encounters low level of problems as shown in Figure 4-28.

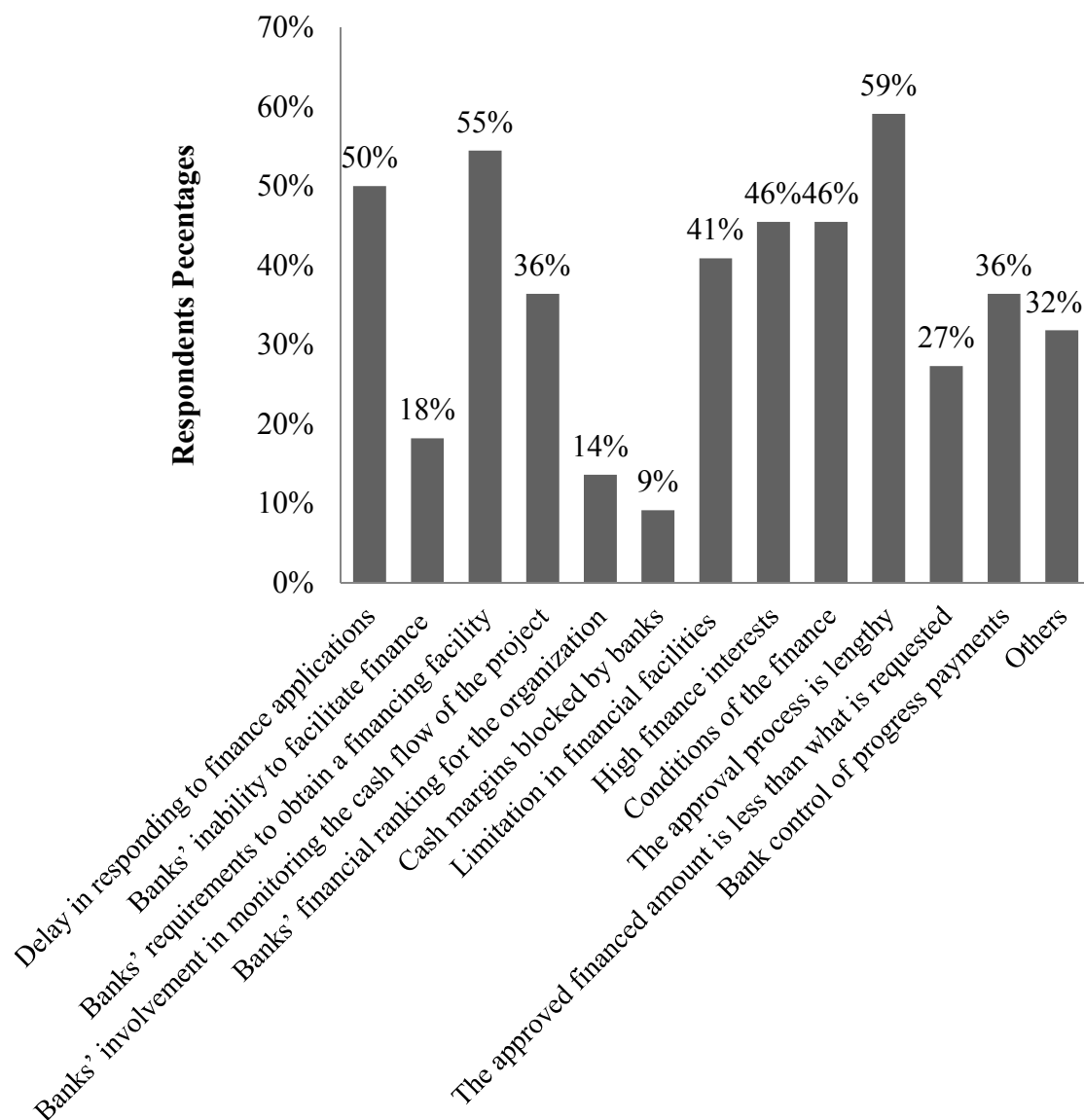


Figure 4-28: Problems That Contractors Encounter When Applying for Banking Facility

CHAPTER 5

SUMMARY OF THE STUDY, CONCLUSION AND RECOMMENDATIONS

This chapter presents the summary, the conclusion and the recommendations of the study.

5.1 Summary of the Study

Financial management is one of the most important tools which need to be employed by the contractors for the purpose of obtaining the best financial status for their organizations. The contractors' sustainability in the market depends mainly on how they manage the cash that flows in and out of their projects.

The main objectives of this study was to reveal the cash flow process in construction projects, the current construction projects' financing techniques followed by contractors in Saudi Arabia, the performance of these techniques, the problems and difficulties that contractors in Saudi Arabia encounter in financing construction projects and the strengths and weaknesses of these techniques.

An intensive literature review was performed to master the subject of the study and to develop two structured questionnaires to collect the necessary data. This data was collected from the financial personnel of grade I, II, and III contractors and from banking

facilities personnel of the major banks in Saudi Arabia. A total of 25 contractors and 9 banks participated in the study.

5.2 Major Findings

The major findings of this study are listed as follows:

A. Cash Flow Process

- 1- The costs of materials, labors, equipment, subcontractors, overhead and mobilization are the main cash outflow for a construction project. Materials, subcontractors and labors' costs comprise the highest portion of a project's total cost.
- 2- Contractors in Saudi Arabia tend to subcontract about a third of their projects' work. The large segment of the money borrowed from banks is used to finance all or part of these subcontracted works.
- 3- Contractors use their available cash mainly to pay either for relatively low-value cost items (equipment, overhead), or for cost items which are important to be paid on time (labors).
- 4- Two factors were found to be the major influencers of the amount of cash distributed to different cost items of a construction project. These are:
 - a. Project Type.
 - b. Contract clauses and conditions.
- 5- The major financing source for a construction project's materials is credit with suppliers.

- 6- The major sources for financing equipment, labors and overhead for a construction project is a contractor's assets.
- 7- The major financing source for a construction project's subcontracted works is progress payments.
- 8- The major financing source for a construction project's mobilization is advance payment.
- 9- Three major factors were found to be the main determinants on the selection of the most suitable source to finance a certain cost item of a construction project:
 - a. The time of the project in which this cost item is incurred.
 - b. The priority and importance of this cost item to be paid on time.
 - c. The duration of the financed activity (long term or short term activity).
- 10- Contractors in Saudi Arabia don't rely on banking facilities as a main funding source in financing any of the project cost items.
- 11- The majority of contractors in Saudi Arabia receive advance payments in some or all of their undertaken projects with an average value of 15% of the contract price.
- 12- A majority of contractors in Saudi Arabia find that the amount of advance payment is not sufficient.
- 13- Most of construction contracts in Saudi Arabia define a period of 1 month between progress payments.
- 14- About half of projects' owners in Saudi Arabia delay paying progress payments beyond their due date with an average amount of delay ranging between 30 and 60 days.

- 15- The lengthy approval process of the submitted invoices by contractors is the main reason behind progress payments delay.
- 16- A majority of contractors continue working in projects despite delay in payments and tend to borrow money from other projects' accounts to fund the projects with progress payments delay.
- 17- Retention is applied in the majority of construction contracts in Saudi Arabia with average percentages of 10% of the contract price.
- 18- Contractors prefer that their retained money be deducted from the progress payments rather than submitting retention bonds to the owners.
- 19- In order for the owner to release retention and final payments, the contractors are required to handover the project and submit the corresponding guarantees letters.
- 20- A majority of contractors in Saudi Arabia conduct cash flow forecasting prior to bidding their projects. However, contractors limit the implementation of cash flow analysis to be utilized for control purposes and to determine the most suitable financing technique.
- 21- Crucial information that can be extracted from cash flow analysis, such as overdraft amount, is not desirable for contractors.
- 22- A significant percent of contractors in Saudi Arabia (40%) undergo financial failure due too poor cash flow management in at least one of their annual contracts.

B. Financing Techniques

- 1- Contractors in Saudi Arabia almost equally implement internal and external financing techniques to finance their projects.
- 2- Individually, a contractor applies either internal or external financing with much higher percentage than the other.
- 3- Internal financing techniques, with their various types, are applied by close percentages. Contractors use the retained profit, equity and trade credit financing to fund their project without getting help from external sources.
- 4- The internal financing techniques were found to be very suitable and effective for the contractors, while also, involving a reasonable amount of risk. This can be referred to the high demand in the construction industry which assures contractors have their invested money back.
- 5- Loans are the most popular external financing technique applied by contractors, especially long term loans.
- 6- The most suitable and effective financing techniques for the contractors are invoice financing, letters of credit and advance payment bonds.
- 7- Overdraft account has the lowest cost among different financing techniques.
- 8- Almost all of the financing aids entailed similar degrees of risk, except invoice financing, which involved the highest amount of risk.
- 9- Contractors sometimes have no choice but to apply some financing techniques regardless of their costs and risks, e.g. bonds.
- 10- Contractors try to limit applying external financing techniques to fund long term activities.

- 11- Generally, the most suitable financing techniques are the ones that cost too much and involve a high level of risk.
- 12- The contractors try to use a combination of internal and external financing techniques for financing their projects with the least involvement of cost margins and risk.
- 13- Banks were found to be flexible regarding offering the financial needs of contractors. In other words, the supply and demand in the construction financing field are almost balanced.
- 14- Bonds and letters of credits are the most utilized financing applications by contractors from the banks' point of view.

C. Factors Affecting Project Cash Flow

- 1- Owners' payments delay is a major problem that contractors encounter while they finance their projects.
- 2- Because of poor financial management, 17% of the contractors were on the verge of bankruptcy at least one time.

D. Contractors and Banks Relationship

- 1- The banks ranked the majority of their requirements for providing banking facilities to contractors as requirements of high importance.
- 2- A Contractors' reputation in the Saudi market and the reputation of the contracting firms' owners greatly influence the decision of banks on whether to approve or reject a loan request.

- 3- With respect to accepting a contractor's financial application, banks show a flexible attitude towards some contractors with a good reputation and track record.
- 4- A Contractor's bad history in repaying their debts to banks is the main reason for rejecting a financing application.
- 5- Banks depend on guarantees and a contractor's assets to secure themselves more than the available cash with contractors.
- 6- New contractors in the market prefer internal financing solutions rather than banking facilities, as they may not be able to fulfill the banks' requirements and conditions for approving a bank loan request.
- 7- In general, the relation between banks and contractors was found to be stable and have limited problems, which is a good indication.
- 8- The lengthy approval process for a contractor's financing request and the bank's requirements to get this approval are the main difficulties encountered by contractors when they apply for a financing facility from a bank.

5.3 Conclusion

It can be concluded that the contractors are aware of the financial components of their projects. However, unfortunately, they don't implement cash flow management tools effectively. They focus mainly on how to temporarily survive rather than have a well-forecasted financial view.

On the other hand, by the practical experience, the contractors found that the best financial model for them is to combine the different financial techniques to safely carry their projects to the completion stage with minimum financial difficulties.

The financial institutions in the kingdom (banks) have a well-structured system to manage the process of contractors financing. Nevertheless, the contractors have a relatively stable relation with those banks.

Actually, it can be concluded that the contractors try to load all of their financial deficiencies on external entities, e.g. project owners, rather than deeply evaluating their current financial management practices and try to improve them.

Generally, the key players in the construction contracting firms in Saudi Arabia need to concentrate on having a precious and clear view of the cash flow of their projects during pre-construction stages. This will lead them to take better decisions in the regard of managing the financial structure of their projects.

Finally, to define the best financial system, we can state that the most effective financial application is the one that assures two major functions:

1- Liquidity on the short term.

2- Profitability on the long term.

5.4 Recommendations

Contractors are advised to consider the following recommendations to improve their financial management applications:

- 1- Improve the current cash flow management practices by implementing detailed forecasting prior to the bidding stages of a project and by monitoring and updating this forecast model along the project execution stages. Some of the considerations that may improve the cash flow process for contractors are:
 - a. Effectively control a project's materials cost and ensuring a good relation with materials suppliers to effectively utilize the contractor's credit with them.
 - b. Minimize the amount of the subcontracted work, which consumes the major amount of the borrowed money from banks, the one which has a relatively high corresponding cost.
 - c. Study the project type and contract conditions very well and ensure that they fit the financial ability of the contractor.
- 2- Strictly follow the project time schedule to ensure the highest effectiveness of the different financing techniques.
- 3- Avoid borrowing money from an ongoing project account to fund another project.
- 4- Consider safety factors while preparing the cash flow forecasting model. The owner's payments delay, the project delay and the absences of certain financing sources should be accounted for in the forecasting process. In other words, more of 'what if' models should be applied prior considering the final shape of the cash flow forecast model.

- 5- Agree with the project owner on an effective and smooth approval process for the progress invoices and define it clearly in the project contract.
- 6- Formulate a recovery plan in case of an owner's temporary failure in liquidating the contractor with the due payments. This will ensure that the contractor's work flows smoothly by not being needlessly interrupted and will also guarantee a well-managed financial system.
- 7- Precisely determine the amount of needed cash and the time at which it will be needed. This will help the contractors leverage all the advantages for each of the applied financing techniques.

Banks, as well, are advised to consider the following recommendations to enhance the financial systems applied by contractors in Saudi Arabia:

- 1- Improve the approval process for a contractor's application considering time effectiveness.
- 2- Restudy the requirements and securities which are asked from a contractor before approving his application, especially for new contractors in the market.

5.5 Recommendations for further studies

- 1- Study the performance of cash flow management practices by contractors.
- 2- Study the effectiveness of the current applied cash flow forecasting models.
- 3- Study the reliability of implementing 'Project Finance' theory by local contractors.
- 4- Study the possibility of establishing pre-structured financial models to be implemented in different types of construction projects.

References

1. *About Us.* (2014). Retrieved from Arab National Bank: <https://www.anb.com.sa/aboutus.asp>, December 5.
2. Al-Dulaijan, S. U. (1987). *Construction Financing in Saudi Arabia (M.Sc. Thesis)*. Dhahran: King Fahd University of Petroleum and Minerals.
3. *Bank History.* (2013). Retrieved from Saudi Hollandi Bank: <http://www.shb.com.sa/ar/about/AboutSHB/History.aspx>
4. Callahan, K. R., Stetz, G. S., & Brooks, L. M. (2011). *Project Management Accounting*. John Wiley & Sons.
5. Clough, R. H., Sears, G. A., & Sears, S. K. (2000). *Construction Project Management*. New York: John Wiley & Sons, Inc.
6. Crundwell, F. (2008). *Finance for engineers : evaluation and funding of capital projects*. Springer-Verlag London Limited.
7. *Dissertation Writing Help Online Services For UK, USA, AU.* (n.d.). Retrieved from Dissertation Help Online Web Site: <http://dissertationhelponline.blogspot.com/2012/01/research-strategy.html>
8. Fight, A. (2006). *introduction to project finance*. Burlington: Butterworth-Heinemann.
9. Gatti, s. (2008). *project finance in theory and practice*. san diego: academic press.

10. Halpin, D. W., & Senior, B. A. (2009). *Financial Management and Accountings Fundamentals for Construction*. Hoboken, NJ: Jhon Wiley and Sons, Inc.

11. Hendrickson, C. (1998). *Project Management for Construction*. Pittsburgh: C. Hendrickson.

12. Kenley, R. (2003). *financing construction*. london: spon press.

13. Kish, L. (1995). *Survey Sampling*. New York: Wiley.

14. Kothari, C. R. (2004). *Research Methodology*. Delhi: New Age International (P) Ltd., Puplisher.

15. Lee, D.-E., Lim, T.-K., & Arditi, D. (2012). Stochastic Project Financing Analysis. *Journal of Construction Engineering and Management*, March, 138(3), 376-389.

16. M.A. (2004). *Reports*. Retrieved from SAMA: <http://www.sama.gov.sa/OtherReportsLib/Mo432.pdf>, February.

17. McCadden, S. (2012). *The Design/Builder's Blog*. Retrieved from Shawn McCadden Web Site: <http://www.shawnmccadden.com/the-design-builders-blog/bid/85323/Purpose-of-Accounting-and-Financial-Management-For-Contractors>, December 26.

18. Park, H.-K. (2004). Cash Flow Forecasting in Construction Project. *Journal of Civil Engineering*, May, 8(3), 265-271.

19. Ross, A., & Williams, P. (2013). *Financial Management in Construction Contracting*. Oxford: A John Wiley & Sons,Ltd., Publication.

20. Scannella, E. (2013). Bank Lending in Project Finance: The New Regulatory Capital. *International Journal of Economics and Finance*, 5(1), 218-227.
21. Singh, H. (2009). *Construction Project Management*. Chandigarh: Abhishek Publications .
22. Steffan, B. B. (2008). *Essential management accounting how to maximise profit and boost financial performance*. London Philadelphia: Kogan Page.
23. Tarek, Z., & Yaqiong, L. (2014). Cash flow modeling for construction projects. *Engineering, Construction and Architectural Management*, 21(2), 170-189.
24. Taylor, C. (2014). *About.com Statistics*. Retrieved from About.com: <http://statistics.about.com/od/Glossary/a/What-Is-A-Statistical-Population.htm>
25. Tiong, I., & Yea*, K. T. (1993). Project financing as a competitive strategy in winning overseas jobs. *International Journal of Project Management*, May, 11(2), 79-86.
26. Yates, J. K. (2007). *Global Engineering and Construction*. Hoboken: John Wiley & Sons, Inc.
27. Yescombe, E. R. (2014). *Principles of Project Finance*. Burlington: Elsevier Science.

APPENDICES

Appendix (1): Contractors' Oriented Questionnaire

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

Ministry of Higher Education

King Fahd University of Petroleum & Minerals

COLLEGE OF ENVIRONMENTAL DESIGN

Dept. of Construction Engineering & Management



وزارة التعليم العالي

جامعة الملك فهد للبترول والمعادن

كلية تصميم البيئة

قسم هندسة وإدارة التشييد

Questionnaire

Dear participant,

I am a student at the master program of the Construction Engineering and Management department of the College of Environmental Design at King Fahd University of Petroleum and Minerals. I am working in my Master thesis under the supervision of Professor Ali Shash. My Master thesis topic is "Financial Management of Construction Projects in Saudi Arabia". This study attempts to improve a contractor's cash flow processes, reveal the optimum financing techniques, and to reveal the problems and difficulties that contractors encounter in financing their projects.

The purpose of this letter is to invite you to participate in this study by providing the requested information via the attached questionnaire. The questionnaire consists of five parts, which contain questions seeking information that will help in achieving the study objectives. We assure you that the information will be treated with great confidentiality, will be strictly used only for research purposes, and will be reported in aggregate format.

We understand that your time is important. The questionnaire will take approximately 10 to 15 minutes of your valuable time to complete. Your participation is greatly appreciated.

Please return the completed questionnaire to the following address:

Abdulaziz Al Qarra,
CEM Department, K.F.U.P.M.
P.O. Box 1627, Dhahran 31261
Mobile: +966553787989
E-mail: g201203700@kfupm.edu.sa

Thank you and if you need further information please contact me any time on my mobile and/or email.

Yours sincerely;

Abdulaziz Al Qarra
Graduate Student, CEM Department
King Fahd University of Petroleum & Minerals
asqarra@gmail.com

Professor Ali Shash
Construction Engineering & Management
King Fahd University of Petroleum & Minerals
aashash@kfupm.edu.sa

It is greatly appreciated if this questionnaire is completed by a person who is involved in managing the finance of the organization, to obtain valuable and reliable information on the subject of this study.

تظهران ٣١٢٦١ • المملكة العربية السعودية • تلفون : ٣٥٩٠ - ٨٦٠ (٠٣) • فاكس : ٤٠١٩ - ٨٦٠ (٠٣)
DHAHRAN 31261 • SAUDI ARABIA • Telephone: (03) 860-3590 • Fax: (03) 860-4019

Part (1): Organization Profile

This part contains questions seeking information about your organization. Kindly answer the following questions either by writing your answers in the given spaces, or, by placing a **tick (✓)** in the appropriate box:

1. Organization Name: (Optional) _____
2. What is the age of your organization in years?

<input type="checkbox"/> Less than 5	<input type="checkbox"/> 5 to less than 10	<input type="checkbox"/> 10 to less than 15
<input type="checkbox"/> 15 to less than 20	<input type="checkbox"/> 20 to less than 25	<input type="checkbox"/> Equal to or more than 25
3. What is the number of your organization employees?

<input type="checkbox"/> Less than 50	<input type="checkbox"/> 50 to less than 200	<input type="checkbox"/> 200 to less than 500
<input type="checkbox"/> 500 to less than 700	<input type="checkbox"/> 700 to less than 1000	<input type="checkbox"/> Equal to or more than 1000
4. What is the average million SR per year of construction contracts executed by your organization?

<input type="checkbox"/> Less than 100	<input type="checkbox"/> 100 to less than 200	<input type="checkbox"/> 200 to less than 500
<input type="checkbox"/> 500 to less than 700	<input type="checkbox"/> 700 to less than 1000	<input type="checkbox"/> Equal to or more than 1000
5. What is your organization capital in millions SR?

<input type="checkbox"/> Less than 1	<input type="checkbox"/> 1 to less than 10	<input type="checkbox"/> 10 to less than 50
<input type="checkbox"/> 50 to less than 100	<input type="checkbox"/> 100 to less than 500	<input type="checkbox"/> Equal to or more than 500
6. What are the types of projects executed by your organization (Please select all that apply)?

<input type="checkbox"/> Building	<input type="checkbox"/> Industrial	<input type="checkbox"/> Infrastructure
<input type="checkbox"/> Utilities	<input type="checkbox"/> Special Structures	
<input type="checkbox"/> Others, please specify: _____		
7. Where is the location of your organization head office?

<input type="checkbox"/> Dammam	<input type="checkbox"/> Khobar	<input type="checkbox"/> Jubail
<input type="checkbox"/> Dhahran	<input type="checkbox"/> Others, please specify: _____	

Part (2): Respondent's Profile

This part contains questions seeking information about the respondent of this questionnaire. Kindly answer the following questions either by writing your answers in the given spaces, or, by placing a **tick (✓)** in the appropriate box:

1. Respondent's Name: (Optional) _____
2. Respondent's E-mail address: _____
3. Respondent's job title in the organization: _____
4. What is your educational level?

<input type="checkbox"/> Diploma	<input type="checkbox"/> Bachelor Degree	<input type="checkbox"/> Master Degree
<input type="checkbox"/> Doctorate of Philosophy	<input type="checkbox"/> Other, please specify: _____	
5. Do you have any educational background in finance management?

<input type="checkbox"/> Yes	<input type="checkbox"/> No
------------------------------	-----------------------------

If "yes", please specify: _____
6. How many years you have been in your current position?

<input type="checkbox"/> Less than 5	<input type="checkbox"/> 5 to less than 10	<input type="checkbox"/> 10 to less than 15
<input type="checkbox"/> 15 to less than 20	<input type="checkbox"/> 20 to less than 25	<input type="checkbox"/> Equal to or more than 25
7. How many years you have been in your current organization?

<input type="checkbox"/> Less than 5	<input type="checkbox"/> 5 to less than 10	<input type="checkbox"/> 10 to less than 15
<input type="checkbox"/> 15 to less than 20	<input type="checkbox"/> 20 to less than 25	<input type="checkbox"/> Equal to or more than 25
8. How many years you have experience in construction industry field?

<input type="checkbox"/> Less than 5	<input type="checkbox"/> 5 to less than 10	<input type="checkbox"/> 10 to less than 15
<input type="checkbox"/> 15 to less than 20	<input type="checkbox"/> 20 to less than 25	<input type="checkbox"/> Equal to or more than 25

Part (3): Financial Transactions and Cash Flow Management

This part contains questions seeking information about financial transactions that occur over the construction of a project. Kindly answer the following questions either by writing your answers in the given spaces, or, by placing a **tick (✓)** in the appropriate box:

*Note: Please notice that the word “Cost” in the following questions is referred to as the cost of the project itself excluding the profit.

1. As % of a project cost, what is the average amount of cash paid for following cost items?

Cost Items	Percent of a Project Cost				
Materials Suppliers	<input type="checkbox"/> Less than 20%	<input type="checkbox"/> 20% to less than 30%	<input type="checkbox"/> 30% to less than 50%	<input type="checkbox"/> 50% to less than 70%	<input type="checkbox"/> Equal to or more than 70%
Subcontractors	<input type="checkbox"/> Less than 20%	<input type="checkbox"/> 20% to less than 30%	<input type="checkbox"/> 30% to less than 50%	<input type="checkbox"/> 50% to less than 70%	<input type="checkbox"/> Equal to or more than 70%
Manpower	<input type="checkbox"/> Less than 20%	<input type="checkbox"/> 20% to less than 30%	<input type="checkbox"/> 30% to less than 50%	<input type="checkbox"/> 50% to less than 70%	<input type="checkbox"/> Equal to or more than 70%
Equipment	<input type="checkbox"/> Less than 20%	<input type="checkbox"/> 20% to less than 30%	<input type="checkbox"/> 30% to less than 50%	<input type="checkbox"/> 50% to less than 70%	<input type="checkbox"/> Equal to or more than 70%
Mobilization	<input type="checkbox"/> Less than 1%	<input type="checkbox"/> 1% to less than 2%	<input type="checkbox"/> 2% to less than 3%	<input type="checkbox"/> 3% to less than 4%	<input type="checkbox"/> Equal to or more than 4%
Project Overhead	<input type="checkbox"/> Less than 5%	<input type="checkbox"/> 5% to less than 10%	<input type="checkbox"/> 10% to less than 20%	<input type="checkbox"/> 20% to less than 30%	<input type="checkbox"/> Equal to or more than 30%
General Overhead	<input type="checkbox"/> Less than 5%	<input type="checkbox"/> 5% to less than 10%	<input type="checkbox"/> 10% to less than 20%	<input type="checkbox"/> 20% to less than 30%	<input type="checkbox"/> Equal to or more than 30%

2. From where do you pay for following cost items? (You may select all that apply for each cost item)

Cost Items	Payment Sources					
	Advance payment	Company Assets	Bank loan	Owners' progress payment	Credit	Others, please specify
Mobilization						
Materials Suppliers						
Equipment						
labors						
Subcontractors						
Management						

3. Does your organization receive advance payment for some or all awarded contracts?

- ☐ Yes, if yes please continue.
☐ No, if no please go to question No.8.

4. How many contracts does your organization secure annually with advance payments clauses?
- ☐ Less than 10% of secured projects ☐ 10% to less than 15% of secured projects
☐ 15% to less than 20% of secured projects ☐ Equal to or more than 20% of secured projects
5. What is the average amount of advance payments that are usually stated in contracts?
- ☐ Less than 5% of contract price ☐ 5% to less than 15% of contract price
☐ 15% to less than 25% of contract price ☐ Equal to or more than 25% of contract price
6. How does your organization repay the advance payment to owners?
- ☐ Percent of progress payments
☐ Constant amount deducted from progress payments
☐ Others, please specify: _____
7. What is your opinion on the following statement "An advance payment is usually sufficient to finance a project"?
- ☐ Strongly Agree ☐ Somewhat Agree ☐ Agree
☐ Somewhat Disagree ☐ Strongly Disagree
8. How frequently does your organization submit progress invoices to a project owner?
- ☐ Monthly ☐ At designated milestones
☐ After completion of certain work ☐ Other, please specify: _____
9. Do owners pay progress payments on time?
- ☐ Yes, if yes please go to question No.13.
☐ No, if no please continue.
10. What is the average extent of delays in progress payments?
- ☐ Less than 30 days beyond their due date
☐ 30 to less than 60 days beyond their due date
☐ 60 to less than 90 days beyond their due date
☐ 90 to less than 120 days beyond their due date
☐ Equal to or more than 120 days beyond their due date
11. What are the reasons for owners' delay in progress payment? (Please select all that apply)
- ☐ Approval process ☐ Corruption
☐ Bureaucracy ☐ Others, please specify: _____

12. How does your organization react when an owner delays progress payments for more than two months?
- ☐ Continue work and delay payments to labor, management, and suppliers
 - ☐ Continue work by borrowing money from a bank with intention to claim the interest from the owner
 - ☐ Continue work by borrowing money from another ongoing project account
 - ☐ Continue work by borrowing money from our organization's available cash with intention to claim an interest from the owner
 - ☐ Stop the work until payments are made
 - ☐ Others, please specify: _____
13. Do some awarded contracts to your organization have retention provisions?
- ☐ Yes, if yes please continue.
 - ☐ No, if no please go to question No.18.
14. What is the average amount of retention that is held from your progress payments?
- ☐ Less than 5%
 - ☐ 5% to less than 10%
 - ☐ 10% to less than 15%
 - ☐ Equal to or more than 15%
15. When does your organization request retention payment from owners?
- ☐ Less than 30 days from receiving certificate of completion
 - ☐ 30 to less than 60 days from receiving certificate of completion
 - ☐ 60 to less than 90 days from receiving certificate of completion
 - ☐ Equal to more than 90 days from receiving certificate of completion
16. What are the usual contract conditions for releasing the retention amount by owners? (Please select all that apply)
- ☐ Project handover
 - ☐ Retention invoice
 - ☐ Guarantee letters
 - ☐ Zakat\income tax certificate
 - ☐ Certificate of payment to firm's employees
 - ☐ Other, please specify: _____
17. When do owners usually pay retentions?
- ☐ Less than 10 days from invoicing
 - ☐ 10 to less than 30 days from invoicing
 - ☐ 30 to less than 60 days from invoicing
 - ☐ 60 to less than 90 days from invoicing
 - ☐ Equal to or more than 90 days from invoicing
18. When does your organization request final payment from owners?
- ☐ Less than 30 days from receiving certificate of completion
 - ☐ 30 to less than 60 days from receiving certificate of completion
 - ☐ 60 to less than 90 days from receiving certificate of completion
 - ☐ Equal to more than 90 days from receiving certificate of completion

19. What are the usual contract conditions for releasing the final payment amount by owners?
(Please select all that apply)

- | | |
|---|---|
| <input type="checkbox"/> Project handover | <input type="checkbox"/> Retention invoice |
| <input type="checkbox"/> Guarantee letters | <input type="checkbox"/> Zakat\income tax certificate |
| <input type="checkbox"/> Certificate of payment to firm's employees | <input type="checkbox"/> Other, please specify _____ |

20. When do owners usually pay final payments?

- | | |
|---|---|
| <input type="checkbox"/> Less than 10 days from invoicing | <input type="checkbox"/> 10 to less than 30 days from invoicing |
| <input type="checkbox"/> 30 to less than 60 days from invoicing | <input type="checkbox"/> 60 to less than 90 days from invoicing |
| <input type="checkbox"/> Equal to or more than 90 days from invoicing | |

21. Do you perform a cash flow analysis or forecasting before bidding for a project?

- ☐ Yes, if yes please continue.
☐ No, if no please go to part No. 4.

22. What is the purpose of cash flow analysis? (Please select all that apply)

- ☐ Determine the amount of overdraft
☐ Determine the amount of the cost of money to include in a project bid
☐ Determine the financing method
☐ Set a cash flow baseline for control purposes
☐ Others, please specify: _____

23. As % of your organization annual contracts, how many contracts financially fail because of poor cash flow management and forecasting?

- | | | |
|---|---|--|
| <input type="checkbox"/> None | <input type="checkbox"/> Less than 5% | <input type="checkbox"/> 5% to less than 10% |
| <input type="checkbox"/> 10% to less than 15% | <input type="checkbox"/> 15% to less than 25% | <input type="checkbox"/> Equal to or more than 25% |

Part (4): Current Applied Financial Techniques

This part contains questions seeking information about the financial techniques which your organization currently applies. Kindly answer the following questions either by writing your answers in the given spaces, or, by placing a **tick (√)** in the appropriate box:

1. What are the techniques, which your organization applies to finance its projects?

- ☐ Self-Financing ----- % (If 0%, please **go to** question No.3)
- ☐ Banking Facilities Financing ----- % (If 0%, please **continue** and **skip** question No.3)

Total = 100%

2. What are the Self-Financing techniques that your organization usually applies to finance projects, and what is the average amount (percent of a contract price), which is used to finance a project under each of these techniques?

S/N	Self-Financing Techniques	Percent	Amount (% of contract price)
1	Firm's available cash (Retained Profit)	----- %	
2	Equity (Financing by firm's owners\shareholders)	----- %	
3	Trade Credit (Paying debtors when cash is available)	----- %	
4	Other, please specify: _____	----- %	
Total		100%	

3. What are the Banking Facilities that your organization usually applies to finance projects, and what is the average amount (percent of the contract price), which is used to finance a project under each of these techniques?

S/N	Banking Facilities Types	Percent	Amount (% of contract price)
1	Short Term Loans (Max. 1 year)	----- %	
2	Term Loans (Max. 3 years)	----- %	
3	Long Term Loans	----- %	
4	Overdraft Accounts	----- %	
5	Invoice Financing	----- %	
6	Bid Bonds	----- %	
7	Advance Payment Bonds	----- %	
8	Performance Bonds	----- %	
9	Retention Bonds	----- %	
10	Letters of Credit	----- %	
11	Hire Purchase\Leasing (For equipment's funding)	----- %	
12	Other, please specify: _____	----- %	
Total		100%	

4. Banks may necessitate the following requirements and securities from contractors to access a banking facility for a project, please indicate which of these requirements and securities are frequently requested from your organization when requesting banking facilities for a project:

Legend: (1) Required all the time (2) Sometime Required (3) Not required

S/N	Requirements\Securities	Frequency		
		1	2	3
1	Organization's profile			
2	Organization's experience in the construction field			
3	Organization's financial history			
4	Profiles of organization's owners			
5	Contractor's clients characteristics			
6	Financial statement of the organization			
7	Audition of the financial statement			
8	Accounts receivable			
9	Balance Sheet			
10	Income Statement			
11	List of ongoing contracts			
12	List of under bidding contracts			
13	List of completed contracts			
14	Assets for collateral (Lands, equipment, stocks, etc.)			
15	Personal guarantees			
16	Corporate letter of guarantees			
17	Billing terms and policies			
18	Project time schedule			
19	Project type			
20	Contract value			
21	Cash flow projection			
22	Contract type			
23	Clarity of scope of work			
24	Others, please specify:_____			

5. What are the problems that your organization encounters when applying for bank facilities for a project? (Please select all that apply)

- ☐ Delay in responding to finance applications
- ☐ Banks' inability to facilitate finance
- ☐ Banks' requirements to obtain a financing facility
- ☐ Banks' involvement in monitoring the cash flow of the project
- ☐ Banks' financial ranking for the organization
- ☐ Cash margins blocked by banks
- ☐ Limitation in financial facilities
- ☐ High finance interests
- ☐ Conditions of the finance
- ☐ The approval process is lengthy
- ☐ The approved financed amount is less than what is requested
- ☐ Bank control of progress payments
- ☐ Others, please specify:

6. The followings are potential factors that may affect projects financing. You are kindly requested to indicate the level of effect of these factors on projects financing in your organization by placing a **tick** (✓) in the appropriate box for a scale of 1 to 5 where "1" represents a very severe effect and "5" represents a no effect.

S/N	Problems	Level of Effect				
		1	2	3	4	5
1	Owner's Payments delay					
2	Delay in advanced payments					
3	Project delay by owner or consultant					
4	Poor cash management in our organization					
5	Financing the project using the allocated fund for other projects					
6	Over estimation of the required loan					
7	Under estimation of the required loan					
8	Poor financial personnel in our organization					
9	Others, please specify and rank: _____					

7. How many times your organization was at the ledge of bankruptcy because of poor financial management?

- ☐ None
- ☐ 1
- ☐ 2
- ☐ 3 - 5
- ☐ More than 5

Please specify the reasons if any:

- 1. _____
- 2. _____
- 3. _____

8. The following is a list of financial techniques, which your organization may apply to projects. You are kindly requested to evaluate the performance of the applied financial techniques, in terms of their suitability, finance effectiveness, cost, and involved risk by placing a **tick (✓)** on a scale **1 to 5** where “**1**” represents very much suitable\ very effective\ very reasonable\ very low risk, respectively, and, “**5**” represents not suitable\ not effective\ very expensive\ very high risk, respectively.

S/N	Financial Techniques	Suitability					Finance Effectiveness					Finance Cost					Risk Involvement				
		1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
1	Firm's available cash (Retained profit)																				
2	Equity (Financing by firm's owners\shareholders)																				
3	Trade Credit (Paying debtors when cash is available)																				
4	Short Term Loans (Max. 1 year)																				
5	Term Loans (Max. 3 years)																				
6	Long Term Loans																				
7	Overdraft Accounts																				
8	Invoice Financing																				
9	Bid Bonds																				
10	Advance Payment Bonds																				
11	Performance Bonds																				
12	Retention Bonds																				
13	Letters of Credit																				
14	Hire Purchase\Leasing (For equipment's funding)																				
15	Other, please specify and rank: _____																				

Part (5): Proposal for New financing Technique (Optional)

This part provides you an opportunity to propose a new financing technique that you believe suitable and satisfactory for contractors needs in terms of profit maximizing and risk minimizing as compared to other existing financial techniques.

This image shows a full page of a handwriting practice worksheet. It consists of multiple sets of three horizontal dashed lines, providing a guide for letter height and placement. The lines are evenly spaced across the entire page, which is otherwise blank.

Appendix (2): Banks' Oriented Questionnaire



Ministry of Higher Education

King Fahd University of Petroleum & Minerals

COLLEGE OF ENVIRONMENTAL DESIGN

Dept. of Construction Engineering & Management



وزارة التعليم العالي

جامعة الملك فهد للبترول والمعادن

كلية تصميم البيئة

قسم هندسة وإدارة التشييد

Questionnaire

Dear participant,

I am a student at the master program of the Construction Engineering and Management department of the College of Environmental Design at King Fahd University of Petroleum and Minerals. I am working in my Master thesis under the supervision of Professor Ali Shash. My Master thesis topic is "Financial Management of Construction Projects in Saudi Arabia". This study attempts to improve a contractor's cash flow processes, reveal the optimum financing techniques, and to reveal the problems and difficulties that contractors encounter in financing their projects.

The purpose of this letter is to invite you to participate in this study by providing the requested information via the attached questionnaire. The questionnaire consists of five parts, which contain questions seeking information that will help in achieving the study objectives. We assure you that the information will be treated with great confidentiality, will be strictly used only for research purposes, and will be reported in aggregate format.

We understand that your time is important. The questionnaire will take approximately 10 to 15 minutes of your valuable time to complete. Your participation is greatly appreciated.

Please return the completed questionnaire to the following address:

Abdulaziz Al Qarra,
CEM Department, K.F.U.P.M
P.O. Box 1627, Dhahran 31261
Mobile: +966553787989
E-mail: g201203700@kfupm.edu.sa

Thank you and if you need further information please contact me any time on my mobile and/or email.

Yours sincerely;

Abdulaziz Al Qarra
Graduate Student, CEM Department
King Fahd University of Petroleum & Minerals
asqarra@gmail.com

Professor Ali Shash
Construction Engineering & Management
King Fahd University of Petroleum & Minerals
aashash@kfupm.edu.sa

It is greatly appreciated if this questionnaire is completed by a person who is involved in managing the finance of the organization, to obtain valuable and reliable information on the subject of this study.

انظران ٣١٢٦١ • المملكة العربية السعودية • تلفون : ٨٦٠-٣٥٩٠ (٠٣) • فاكس : ٨٦٠-٤٠١٩ (٠٣)
DHAHRAN 31261 • SAUDI ARABIA • Telephone: (03) 860-3590 • Fax: (03) 860-4019

Part (1): Bank's Profile

This part contains questions seeking information about your bank. Kindly answer the following questions either by writing your answers in the given spaces, or, by placing a **tick (✓)** in the appropriate box next to the questions:

1. Bank Name: (Optional) _____
2. The bank headquarter is located in:

<input type="checkbox"/> Riyadh	<input type="checkbox"/> Jeddah	<input type="checkbox"/> Khobar
<input type="checkbox"/> Dammam	<input type="checkbox"/> Other, Please Specify _____	
3. What is the bank ownership type?

<input type="checkbox"/> Local	<input type="checkbox"/> International
<input type="checkbox"/> Other, Please Specify _____	
4. For how many years has your bank operating in Saudi Arabia?

<input type="checkbox"/> Less than 5 years	<input type="checkbox"/> 5 to less than 10 years	<input type="checkbox"/> 10 to less than 15 years
<input type="checkbox"/> 15 to less than 20 years	<input type="checkbox"/> 20 to less than 25 years	<input type="checkbox"/> Equal to or more than 25 years
5. What is the total number of employees in your bank?

<input type="checkbox"/> Less than 100 employees	<input type="checkbox"/> 100 to less than 200 employees
<input type="checkbox"/> 200 to less than 300 employees	<input type="checkbox"/> 300 to less than 400 employees
<input type="checkbox"/> Equal to or more than 400 employees	
6. What is your bank capital in millions SR?

<input type="checkbox"/> Less than 20	<input type="checkbox"/> 20 to less than 40	<input type="checkbox"/> 40 to less than 60
<input type="checkbox"/> 60 to less than 80	<input type="checkbox"/> 80 to less than 100	<input type="checkbox"/> Equal to or more than 100
7. How many branches does your bank have in Saudi Arabia?

<input type="checkbox"/> Less than 10 branches	<input type="checkbox"/> 10 to less than 25 branches
<input type="checkbox"/> 25 to less than 50 branches	<input type="checkbox"/> Equal to or more than 50 branches

Part (2): Respondent's Profile

This part contains questions seeking information about the respondent of this questionnaire. Kindly answer the following questions either by writing in the given spaces, or, by placing a **tick (√)** in the appropriate box:

1. Respondent's Name: (Optional) _____
2. Respondent's E-mail address: _____
3. Respondent's job title in the bank: _____
4. What is your educational level?

<input type="checkbox"/> Diploma	<input type="checkbox"/> Bachelor Degree	<input type="checkbox"/> Master Degree
<input type="checkbox"/> Doctorate of Philosophy	<input type="checkbox"/> Other: _____	
5. Do you know how construction projects are developed?

<input type="checkbox"/> Yes. If your answer is "Yes", please continue.
<input type="checkbox"/> No. If your answer is "No", please go to question No.7.
6. How do you know how construction projects are developed? (Please select all that apply)

<input type="checkbox"/> My educational background is in engineering
<input type="checkbox"/> I have a degree in construction engineering and management
<input type="checkbox"/> I have an experience in the construction industry
<input type="checkbox"/> Other, please specify: _____
7. How many years have you been working in the banking industry?

<input type="checkbox"/> Less than 5 years	<input type="checkbox"/> 5 to less than 10 years	<input type="checkbox"/> 10 to less than 15 years
<input type="checkbox"/> 15 to less than 20 years	<input type="checkbox"/> 20 to less than 25 years	<input type="checkbox"/> Equal to or more than 25 years
8. How many years have you been working in the banking facilities department?

<input type="checkbox"/> Less than 5 years	<input type="checkbox"/> 5 to less than 10 years	<input type="checkbox"/> 10 to less than 15 years
<input type="checkbox"/> 15 to less than 20 years	<input type="checkbox"/> 20 to less than 25 years	<input type="checkbox"/> Equal to or more than 25 years
9. How many years you have been in your current position?

<input type="checkbox"/> Less than 5 years	<input type="checkbox"/> 5 to less than 10 years	<input type="checkbox"/> 10 to less than 15 years
<input type="checkbox"/> 15 to less than 20 years	<input type="checkbox"/> 20 to less than 25 years	<input type="checkbox"/> Equal to or more than 25 years
10. How many construction-contracting customers have you served over your carrier?

<input type="checkbox"/> Less than 5	<input type="checkbox"/> 5 to less than 10	<input type="checkbox"/> 10 to less than 15
<input type="checkbox"/> 15 to less than 20	<input type="checkbox"/> 20 to less than 25	<input type="checkbox"/> Equal to or more than 25
11. How many banking facilities have you performed for construction contractors?

<input type="checkbox"/> Less than 25	<input type="checkbox"/> 25 to less than 50	<input type="checkbox"/> 50 to less than 75
<input type="checkbox"/> 75 to less than 100	<input type="checkbox"/> Equal to or more than 100	

Part (3):Offered Banking Facilities

The following is a list of banking facilities, which your bank may offer to construction firms. You are kindly requested to indicate those facilities which your bank avails to construction contractors in Saudi Arabia. Then, please evaluate each of the offered facilities in terms of contractors' utilization by placing a **tick (✓)** in the appropriate box for a scale **1 to 5** where **"1"** represents very high utilization, and **"5"** represents very low utilization. Then, please define the purposes of these loans by placing a **tick (✓)** in the appropriate box (you may select all that apply).

S\N	Banking Facilities	Offered by the bank		Contractors' Utilization					Purpose: The loan is usually to finance ...			
		Yes	No	1	2	3	4	5	Projects	Equipment	Assets	Others, Please specify:
1	Short Term Loans (Max. 1 year)											
2	Term Loans (Max. 3 years)											
3	Long Term Loans											
4	Overdraft Accounts											
5	Invoice Financing											
6	Bid Bonds											
7	Advance Payment Bonds											
8	Performance Bonds											
9	Retention Bonds											
10	Letters of Credit											
11	Hire Purchase\Leasing (For equipment's funding)											
12	Others, please specify and rank:											
13												

Part (4): Requirements for Obtaining Banking Facilities

The following is a list of banks' requirements and securities that your bank may request them from a contractor who applies for a loan. You are kindly requested to indicate the level of importance of the requirements and securities by placing a **tick (√)** in the appropriate box for a scale of **1 to 5** where **"1"** represents very high important requirement and **"5"** represents very low important requirement.

S\N	Requirements\Securities	Level of Importance				
		1	2	3	4	5
1	Contractor's profile					
2	Contractor's experience in the construction field					
3	Contractor's financial history					
4	Profiles of organization's owners					
5	Contractor's clients characteristics					
6	Financial statement of the organization					
7	Audition of the financial statement					
8	Accounts receivable					
9	Balance Sheet					
10	Income Statement					
11	List of ongoing contracts					
12	List of under bidding contracts					
13	List of completed contracts					
14	Assets for collateral (Lands, equipment, stocks, etc.)					
15	Personal guarantees					
16	Corporate letter of guarantees					
17	Billing terms and policies for the project					
18	Project time schedule					
19	Project type					
20	Contract value					
21	Cash flow projection					
22	Contract type\scope of work					
23	Clarity of scope of work					
24	Others, please specify and rank: _____					

Part (5): Encountered Problems after Facilities Approval

The following is a list of potential problems that your bank may encounter over the life of the loan to a contractor. Please state your level of agreement with these reasons by placing a **tick (✓)** in the appropriate box for a scale of **1** to **5** where “**1**” represents Strongly Agree, “**2**” Somewhat Agree, “**3**” Somewhat Disagree, “**4**” Disagree, and, “**5**” Strongly Disagree.

S/N	Problems	Level of Agreement				
		1	2	3	4	5
1	Contractors delay payments beyond due dates					
2	Contractors fail to fulfill their covenants of finance documentation					
3	Changes in the ownership of a project prior an agreed upon date					
4	Contractors subjected to a court judgment					
5	Revoking of any permits or license for contractor					
6	The project is abandoned					
7	Failure of any party in the project contract					
8	Contractor's poor performance in executing his project					
9	Others, please specify and rank:					

Part (6): Reasons for Rejecting a Contractor's Application for a Bank Facility

The following is a list of potential reasons that your bank may disapprove a contractor's application for a bank facility. Please state your level of agreement with these reasons by placing a **tick (✓)** in the appropriate box for a scale of **1** to **5** where **"1"** represents Strongly Agree, **"2"** Somewhat Agree, **"3"** Somewhat Disagree, **"4"** Disagree, and **"5"** Strongly Disagree.

S/N	Reasons	Level of Agreement				
		1	2	3	4	5
1	The contractor has a bad history in payment					
2	The contracting firm's owners have no good financial repute					
3	The contractor history in breaching finance contracts					
4	The contractor previous history in claims					
5	The contractor is new to the construction industry					
6	Revoking of any permits or license for contractor					
7	The contractor's size in term of his assets					
8	The contractor's available cash in his accounts					
9	The contractor has a history of poor performance in executing his projects					
10	The project owner					
11	The endorsement documents					
12	Others, please specify and rank:					

Vitae

Name : Abdulaziz Al Qarra

Nationality : Palestinian.

Date of Birth : 1/26/1989

Email : asqarra@gmail.com.

Address : Riyadh, Saudi Arabia.

Academic Background : Civil Engineering, Cairo University 2011.

Membership : American Concrete Institute Member.

Workshops : Conducting workshops in Construction Management topics for the Chamber of Commerce in Eastern Province, Saudi Arabia.